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ORIGINAL ARTICLES

FRACTURES OF THE MANDIBLE*

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PROBABLY this paper may not be of interest to all men engaged in orthodontia. In the last six or seven months I have been doing quite a bit of fracture work. This paper has been the outcome of the present conditions throughout the world.

In studying over the various methods in use today on the fronts of Germany and England, I was rather surprised to see the resemblance the appliances bear to our orthodontic appliances.

In presenting this paper I wish to state that it is merely a summary of information gathered from various papers, principally the *British Dental Journal,* and various books published on oral surgery; viz., Blair, Marshall and Brophy. In many cases the authors' exact writings have been used to more forcibly express the ideas. The subject I believe to be a timely one, and inasmuch as the mechanical technic in the reparative treatment of our subject bears a close relationship to orthodontia, I thought it might be of interest.

During the last three years I have had many cases of fractured jaws under my care, but in considering the fact that the fractures of the war zone were as a class not simple, but of a multiple, compound or complicated nature, the question occurred to me—what line of procedure would I follow were I, as an orthodontist, forced to treat some of these cases? It is with this in mind that I offer this paper.

England, France, Italy and Germany have established special hospital units for the treatment of all oral surgery cases. Today those suffering from injuries of the face and jaws are looked upon as heroes, but later are objects of dread if not properly treated, and the treatment can not even at its best, be always car-

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ried out along ideal lines suggested by those drawing their experience from ordinary practice.

The surgeon should keep in mind the prime necessity of dental splints, and the dentist that treatment is required beyond the mere adaptation of splints. In the beginning of the war complaint was made of the ordinary bandage used primarily as a temporary dressing. It is conceded that at the dressing station the simplest means must be adopted to cover the wound and arrest bleeding; but the wounded were often left for hours or even days at the field or base hospital without the bandage being renewed. It becomes soaked with saliva, discharges and liquid food, and forms a germ-breeder of the most dangerous type. Unless a splint has been inserted, the bandage gives no support to the broken bones; indeed, if a bandage remains for a period, drawing the chin backwards, the broken fragments are dislocated distally and produce a deformity of the face giving a birdlike appearance. Further, the soft tissues are deprived of their nourishment, giving rise to suppuration, sloughing and cicatricial contractions, that necessitate extensive plastic operations subsequently. Adhesions form between the mucous membrane of the lips, tongue and cheeks and the soft tissues over the jaw, which have to be stretched or divided before splints or any prosthetic apparatus can be used.

The first aim in all severe cases should be directed towards saving the life of the patient, and not until this is insured should splints be adapted or other surgical measures carried out. The next step should be directed towards insuring union of the jaw; if this can be carried out by restoring the contour of the jaw and occlusion, all the better, but if, by endeavoring to restore the contour of the jaw and occlusion, a risk is run of obtaining nonunion, then the ideal should give way to the practical, for it is far better for an individual to have a firm mandible and a moderate amount of malocclusion than an ideal shaped bone which is unable to bear the strain of mastication. The masticating surface in a mandible with a malunion can often be easily rendered efficient by artificial dentures.

At the oral hospital begins the combined work of the surgeon and dentist. Plate radiograms are taken to ascertain the condition of the bones and to discover any portions of metal in the soft tissues that may have become embedded; also films of the immediate seat of injury, as well as models are taken. All dead tissue and separated pieces of bone and any teeth separated from their attachment are removed as shown by the radiogram. All living tissue is carefully preserved, the basic idea being to remove all irritation from the bone. If the wound is clean its edges are sutured provided this does not present technical difficulties; on the other hand, if the wound be suppurating and if the damage be great, with or without the opening of adjoining sinuses, then the treatment begun will be continued. Daily, two or three times, especially after meals, the wound and mouth will be thoroughly syringed out with weak solutions of hydrogen peroxide or permanganate of potash and the gums are swabbed with a 2 per cent solution of iodine in alcohol. The recovery of the wound rapidly follows, but of great assistance is the exciting of a better blood supply, by exposure to sunlight or artificial light, associated with massage of the tissues. These aids to increased nourishment of the tissues are largely used at Dusseldorf, Germany, both before

and after plastic operations, and it seems that by these means the sloughing of pieces of tissue, portions of flaps, are often prevented.

The next step is to anesthetize the patient and examine the character of the injury and see how far reduction of the fracture is possible. The necessary septic teeth are removed, as well as the teeth bordering on the line of fracture; the importance of this latter step will be referred to later. Any sinuses present are also examined and treated, but no attempt is made to remove necrosed bone unless it has sequestrated. The necessary splints are made and adjusted if needful under an anesthetic. When healing of the bone is complete, the splints are removed and a simple retention splint inserted, and the patient may be said to have reached the convalescent stage.

If the man is immediately returned to his depot he will find himself unable to cope with ordinary food and will therefore go "sick." To avoid this and gradually accustom him to acquire the power to bear the brunt of efficient mastication, he is taken through a graduated course of diet. In civilian practice the construction of such a series of diets is easy, but in military life it has to be drawn up from the variety of foods coming within the limit of army regulations as follows:

1. Fluids; 2. minced; 3. boiled; and 4. ordinary.

1. Milk, beef tea, chicken broth, supplemented by "extras," to be ordered when necessary for the treatment of the case (*vide* regulations).

2. Minced chicken, and minced ordinary diet, supplemented with minced fish, eggs, and semifluid puddings.

3. Boiled ordinary diet supplemented by fish, eggs, suet puddings, toast.

4. Ordinary diet in accordance with the regulations.

It is found that patients who have sustained jaw injuries rapidly lose weight; hence the provision of suitable diets becomes a matter of first-rate importance. The patient must be carefully dieted, not only to increase his weight and strength, but also in order that full advantage may be taken of the mechanical advantages of a graduated diet in bringing about increased muscular movements and restoration of the functions of the jaw, supplemented by massage and other mechanical means.

Most writers protest against attempting to wire the bone in fractures of the lower jaw. This is not justified in civil practice, unless it can be done aseptically as in simple fractures (which do not occur in the horizontal ramus of the lower jaw). In this War the vast majority of fractures are the result of bullet wounds, and there is always some comminution. Cases are mentioned and illustrated where cure was long delayed on account of unwise attempts at wiring, and only commenced after the wire had been removed. The oral surgery of the Balkan wars, 1912 to 1913, bears this out.

Similarly, the attempt to fix immediately prosthetic appliances, or troughs, to the bone by wiring is condemned. The results attained in Tokio during the Japanese War were by no means satisfactory (though in the cases of those who lived to reach the hospital malunions had already occurred, and attempts were made to render life endurable to these pitiable objects, after dividing the malunited bone, by wiring troughs or prosthetic appliances to the separated ends of the bone). Even the immediate stitching up of an extensive, contused wound

of the soft tissues of the face is questioned, and in every case is condemned if associated with injury to the jaws, unless and until a splint has been inserted.

When there is little loss of substance and the bone, if fractured, is not displaced, then the early insertion of sutures appears to be demanded, since otherwise the displaced soft tissues tend to shrink and form adhesions with neighboring tissues. On the other hand, many wounds have not healthy edges and are infected, hence primary union seldom occurs. Often a general anesthetic can not be given and the local anesthetic as used in the field seldom seems efficient, indeed it apparently increases the inflammation of the tissues. The circumstances are generally adverse to an aseptic, workman-like operation. The sutures (usually of silk) frequently cut out, damaging the tissues and diminishing the amount available for the subsequent plastic operation. The recollection of the pain endured indisposes the patient to subsequent operative procedures. It is advised that if immediate sutures seem advisable, if field conditions are not favorable, that the fracture be attended to and that the wound should be painted with iodine and the adjacent skin covered with oil of mastic (mastic dissolved in benzol); a piece of gauze should be lightly placed in the wound and the wound fixed with strapping or by a four-tailed bandage loosely tied. The mouth should be frequently washed out with peroxide of hydrogen; in default of this, water is better than nothing, and the patient should be rapidly transferred to the special hospital. (The distressing dryness of the mouth can be alleviated by use of a lotion consisting of glycerin 400.0, spiritus dil. 50.0, anisi 0.2, ol. menth. pip. 0.2.)

Although fractures of the mandible formed 44 per cent of the gunshot injuries to the bones of the face in the Japanese-China War, no proper arrangements existed for treatment of these in the war with Russia. As a rule, a bandage was applied by a comrade or by the wounded himself, and the treatment in the field and base hospitals was at least inadequate, possibly wrong. This was the more regrettable as Hashimoto* recognized that "with gunshot injuries of bones in other parts of the body the patient may be content with the healing of the wound and consolidation of the fragments, and not often ask further surgical help. The healing powers of Nature do the rest, and disturbed function is compensated by vicarious movement. But it is different with bone injuries of the mandible; these need quite a different technic, a portion of which is in the domain of dental surgery. The finer points of treatment are undertaken by the dental surgeon, the army surgeon contenting himself with occasional superficial help. The function of the mandible, the chewing of food, is prevented by relatively slight displacement of the bony fragments; this does not happen with other bones. If, as not infrequently occurs, suppuration follows and necrotic fragments must be removed, the wound may luckily heal but the 'bite' will be spoiled, on account of the displacement of the bony fragments, and this renders the mastication of food almost impossible. The consequence is impaired nutrition. On account of the actual damage to the soft parts, pus flows out of fistulous openings into the mouth, and the patient swallows these deleterious products. Shortly, the lasting metabolic disturbances, partly through swallowing toxic compounds, partly due to faulty feeding, together with the conse-

*Viscount T. Hashimoto, General Staff-Surgeon of Japan, 1908.

quential alteration of the facial contours, call to mind the cachectic condition coincident with a malignant growth."

The displacements in fractures of the mandible are dependent upon the direction of the force causing the injury, the extent of the injury, and the action of the muscles. Fractures in the region of the molars are accompanied by a depression of the anterior fragment and a swinging over to the affected side, the posterior fragment being usually drawn upwards and inwards. It is to this latter displacement that particular attention is drawn, because according to one of the British writers, advantage may be taken of it to assist healing. In civilian practice the posterior fragment is, as stated, usually drawn upwards and inwards, but in gunshot injuries the impact of the projectile often forces the anterior fragment inwards, and the posterior fragment moves forwards and passes outside the anterior fragment.

In the majority of cases we have to deal with a loss of tissue and we have the following condition present: the posterior fragment is drawn upwards and meets the opposing teeth and the anterior fragment slews round to the injured side. If the upward resistance to the posterior fragment is removed by the extraction of the posterior teeth, the fragment will move still further upwards, but at the same time forwards, and so bridge over the gap of lost tissue. The recognition and utilization of this forward movement is of great practical importance in obtaining union.

A common type of injury is for the bullet to enter the molar region on the one side and find an exit by the molar region on the other. In such cases we may meet with the following displacement: the posterior fragment on the entrance side is drawn upwards and overlaps the anterior fragment, the latter being drawn well backward and over to the "impact" side and considerably depressed. On the exit side the posterior fragment is drawn upwards.

The extreme displacement that may be present in this type of injury is here described. The man had been under treatment for over three months before being admitted to the Croydon Hospital, England. The mandible was fractured on the right side in the region of the first molar; there was a severe fracture on the left side; the right central incisor was in contact with the first molar which was lying horizontally along the margin of the right posterior fragment. The central fragment which was fractured in a horizontal direction was lying across the mouth.

In cases of injury in the incisor region the resulting displacement varies considerably according to the loss of bone. If the loss of bone involves the body of an alveolar process to an equal extent, the two halves of the mandible approximate and we have a parrot-like jaw, but there is little, if any, falling inwards of the fragments. In cases where the loss of the base of the jaw is slight compared to the alveolar process the following displacement occurs:

The two halves of the mandible approximate and engage at the lower part, and there is but slight loss of "chin." The external pterygoids and the mylohyoids tilt the lateral fragments inwards, and when this has occurred to the extent that the buccal cusps of the lower teeth are lingual to the lingual cusps of the upper teeth, the action of the "bite" is to accentuate the lingual movement of the fragments. In this man there was but slight loss of bone along the

lower border of the bone, but there was extensive loss in the region of the alveolar process. This is a type of deformity that can easily be overcome and avoided by prompt insertion of interdental splints.

Fractures of the ramus are accompanied by a deviation of the mandible, to the affected side, accompanied by a marked upward movement, the degree of upward movement corresponding to the loss of tissue.

A common cause of nonunion is the presence in the line of fracture of septic teeth. When a fracture runs between two teeth, the periosteum of the teeth is usually destroyed and a pocket is formed and a stagnation area created. Sepsis follows, and union, even under the most favorable conditions, is often delayed, and, even when union of the bone does occur, the pocket remains, and sooner or later leads to loss of the teeth. On account of this condition many oral surgeons have made it a practice to remove the teeth on each side of the fracture. In many of the cases of nonunion which have been admitted to the various hospitals the cause has been traced to septic teeth in the fracture, the removal of which has been followed by rapid healing.

An important cause of nonunion is want of rest of the fragments. This is typically seen in fractures about the molar region when interdental splints have not been used. In these cases the tendency is for the posterior fragment to be drawn upwards, and the anterior fragment downwards. When the mandible is at rest the teeth occlude; when an effort is made to close the teeth the posterior fragment is pushed down, and the whole series of teeth brought into occlusion. The effect is a constant see-saw action of the fragments and therefore nonunion.

In one case reported injury occurred on March 22, the first molar being carried away. No dental treatment was considered needful, and the patient arrived at Croydon early in November, with the fragments freely movable. The right lower second bicuspid and molars were removed to give rest to the posterior fragment, and within three weeks the fracture had consolidated so that no movement could be obtained.

Fractures in the region of the rami are frequently followed on the repair of the injuries by a considerable interference with the movement of the mandible, due mainly to contraction of scar tissue. The method of treatment by the use of the wooden screw gag is not satisfactory and one has found that a more efficient method is to forcibly stretch the tissues over definite periods followed by rest. The plan adopted is to screw open the mouth at night, the gag remaining in until the morning. The diet, too, should be of a hard character.

A disadvantage of the screw-gag is that it may force the mouth open in an oblique direction, and this is obviously undesirable; the aim should be to ensure an equal distribution of force. This is obtained in the apparatus which was suggested by Captain H. M. Holt. It consists of two curved plates covering the occlusal surfaces of the teeth, the plates being united at each end by screws. The appliance is adjusted to the mouth and the plates are opened to an extent "just not to cause pain."

Associated with injuries of the jaws there is frequently considerable laceration, and in some cases destruction of the cheeks and lips, healing of the wounds being often followed by a depressed cicatrix attached to the jaws. The

soft tissues thus bound down not only considerably restrict the movement of the parts, but at the same time are extremely disfiguring.

In many of the cases plastic operations are necessary, but these operations are not so likely to be required, or if necessary, are more likely to be satisfactory, if the scar tissue is first severed from the jaw and subsequently stretched and massaged. Warm olive oil applied several times daily is very beneficial.

The plan that is being adopted in these cases is as follows: When possible models of the mouth are obtained and a vulcanite splint is constructed to bulge out the soft tissues in the region of the cicatrix. The splint is made so as to firmly occlude with the upper teeth. The cicatrix and the adjacent soft tissues are freely divided from the bone with a pair of scissors, the separation being made close to the bone. While the patient is under the anesthetic the splint is placed in position and modelling composition firmly pressed in between the separated parts, and the construction of the splint is completed. The wound in the mouth is then packed with gauze and the vulcanite splint placed in position within forty-eight hours. Additions are made to the splint from time to time until the soft tissues are in a state of full tension. The stretching of the tissues is assisted by regular massage.

The results that are obtained from this line of treatment are satisfactory. With some patients the opening of the mouth is limited to such an extent that it is impossible to obtain satisfactory models for a large internal splint. In such cases a piece of vulcanite is prepared to pass into the sulcus between the bone and the lip, the vulcanite being attached to an external splint. In one patient the lower lip was firmly adherent to the bone, and the opening of the mouth was extremely contracted. The lip is now supple, the depressed cicatrices have flattened out and dentures have been inserted.

In many of the cases one feels that the delay has been mainly due either to entire neglect to utilize interdental splints or to the nonrecognition of certain underlying principles of treatment. If cases can be brought under proper dental treatment soon after the receipt of injury, one can look forward to rapid and good recovery.

In every case attempt is made to bring the teeth into normal occlusion; when bone is lost, and if, after treatment, a radiogram does not show any new bone formation (although from the description one gathers that this very frequently does occur, even when the ends of the bone are somewhat widely separated), then, subsequently, a bone-graft is inserted.

Lindemann states that in seven months from the beginning of January, 1915, he performed sixty-three cases of bone transplantation. All these were done under a local anesthetic, and of these fifty-six healed absolutely primarily and seven secondarily.

They cut the ends cone shape; these are then inserted into holes drilled in the ends of the fractured jaw. They insist that the essentials to success are: absolute fixity of the portions of jaw by means of splints; a small operation wound, so that the ends of the bone stumps only are exposed and not separated from the surrounding soft tissue; imbedding the transplantate in as much of the surrounding soft tissue as possible before the skin wound is stitched up; the absence of foreign bodies to fix the fragments and awaiting the complete healing

of wounds, etc., before undertaking the operation. Another way of fixing the bone is to cut each end wedge shape, and to slide it into notches cut in the bone stump.

When the fractured portions are not freely movable they are brought into place:

1. By the intermaxillary traction of rubber rings.
2. By the pressure of a screw fastened to a divided metal cap splint.
3. By the force of two metal lever arms attached to the teeth by anchor bands and rings and extending out of the mouth, where, after crossing, the ends are joined by rubber bands.

Sometimes the ligamentous union and the cicatricial tissue between and around the fractured ends are divided with a knife before the correction of the misplacement is commenced.

Intermaxillary traction with rubber bands is only of use when the resistance is not great. Its great advantage is the very different directions in which its force may be applied.

Lindemann prefers to perform all plastic operations of the soft tissue and all bone-grafts under the influence of local anesthesia. He regards this as preferable to general anesthesia, since the latter, either during the administration of the anesthetic or during recovery therefrom, is likely to be associated with some disturbing factor, sickness, movement, etc., inimical to the success of the operation.

In every case he uses novocaine with the addition of suprarenin. In severe cases an injection of morphia is given from fifteen to thirty minutes before the operation. Only powdered nocovaine is used, i. e., no "tabloids," etc. The distilled water obtained is redistilled. The suprarenin is added shortly before the solution is to be used.

For simple cases a purely local injection suffices, but for extensive operations (plastic operations, bone-grafts, etc.), the injection must be into the nerve supplying the region. A 2 per cent solution of novocaine is used with 1 drop of suprarenin to 1 c.c. From ½ to 2 c.c. of the solution is required. The more accurately the nerve is reached, the less is the solution required. The position at which the nerve is to be injected (primary division or branch) will be determined by the extent of the field of operation. Sometimes two neighboring divisions must be injected, and in operations in the midline of face both right and left divisions. The duration of the anesthesia is about an hour and a half, but sometimes lasts two hours.

When in a fractured mandible no teeth are present in the posterior fragment, movement of this is limited by twisting roundthe free end of a somewhat longer wire to form a loop. This loop is embedded in a lump of guttapercha, which rests on the gum of the edentulous fragment, or is wrapped up in iodoform gauze.

For use with wire, bands to encircle the teeth are kept in eight sizes. These bands are deeper and thicker than Angle's bands, and also differ from the latter in that the clamping screw has a tube drilled through its long axis, into which passes the wire of the splints.

The use of impression material in, or without a tray is well known as an

emergency splint. Trays of various sizes without handles but with wire loops soldered to the convex surface of the tray serve for the attachment of straps or bandages which can be passed under the chin or over the top of the head. Black gutta-percha is mostly used.

The splints used in Frankfort are on the lines of orthodontic and fixed apparatus. Displacements were corrected by means of expansion arches and screws, rubber bands, intermaxillary traction, and sometimes head and chin caps connected by elastic bands.

The use of the combined method is recognized in fractures of the maxilla, and for those of the mandible when no teeth are present, but, as at Dusseldorf, Germany, the method has been extended to other cases. The method is adopted for the correction of displacements. When the fragment is in the corrected position, the extra-oral appliance is removed and the intra-oral splint relied on, or altered, to act as a retentive apparatus.

In all cases the fixed point is a wire, or wires, passing downwards from a head bandage; sometimes a plaster bandage and sometimes a bandage with wires encircling the head. The vertical wires are straight, or end in a loop to allow the fixed points to be varied as required. When there is a loop, a second wire is used to steady it. The traction is by rubber bands.

When the bone defect is in the midline it is possible not only to check the tendency to displacement inwards, but also to pull the fragments forward or backward. As previously stated, the form of splint commonly used is the wire splint, one for the maxilla to form the fixed points and one for each portion of the fractured mandible. It is recommended that these splints should be wired to each tooth to obtain absolute fixation. A series of hooks are soldered to the labial and the lingual wires of all the splints to enable the elastic rings to be fixed in any position required. As in most instances the traction should be in a horizontal direction, a wire loop is soldered to the upper splint, which bends downwards to about the level of the articulating surface of the upper teeth. The elastic band, to obtain horizontal traction, is fastened to the labial hook of the upper splint, passes then over the loop and is attached to the lingual hook of one or other of the mandibular splints. When the portions of the mandible are luxated into position a piece of strong wire, bent to shape across the cap, is securely ligatured to the splints on the mandibular fragments. It serves as a retainer till bony union forms, or a bone-graft be completed.

A useful attachment to the wire splint is designed by Schroder to prevent backward displacement of the mandible. A vertical rod is soldered to the lower wire, which fits in a hood soldered to the upper. Metal flanges are also used, soldered to the wires, upper and lower, to act as an opposing force when unilateral movement is desired.

When the rubber bands would not exert sufficient force, an expansion screw is used attached to metal caps. The vertical plates shown not only prevent overexpansion of the fragments, since, when the normal position is reached, they lock against the lingual surfaces of the upper teeth, but they secure bilateral symmetry, because if one side moves more rapidly than the other, its further movement is prevented when it has reached its proper place.

The splint with lever arms is used in cases of extreme resistance. The direc-

tion of the force is regulated by the position of the arms. When the bone is in the correct position, the arms are soldered together with soft solder at their point of crossing, and the portions beyond are cut away. After a time the splint is removed and a retention apparatus, caps joined by wire, is cemented to the teeth.

A form of lever to be used when the jaws can not be separated on account of cicatrices is also used. The rigid wires are fixed to metal cap splints cemented to the teeth, the splint being struck up to a model obtained by forcing open the mouth with a screw wedge. For this purpose an ordinary wooden paper clip is commonly used at Dusseldorf.

The movement in the lower form is caused by the traction of a rubber band attached to the two hooks. It was designed for use when the oral orifice is contracted after plastic operations, especially those undertaken to form a new lower lip. If only a one-sided action be required, it can be obtained by attaching one side to a band round a tooth, this point being fixed, the other moves.

The Gunning Splint is the name given to a splint which embraces both upper and lower teeth. It can be constructed in vulcanite or metal, and finds its best use in cases where there is lateral deviation of the mandible.

The Skull and Mandibular Splint.—An extremely useful adjunct to the interdental splint consists of a skull cap woven out of thick mercerized cotton and bordered by a rim of braid about three-quarters of an inch wide. Two nooks are fitted on each side in front and one behind. The mandibular splint is made from metal and can be fashioned to various shaped mandibles. At the ends the metal is turned over to form catches. The metal cap is connected with the skull portion by cord or tape and according to the pressure exerted one may obtain an upward or a backward pull. This splint is used extensively as an adjunct to interdental splints, with a view of supporting the mandible and so giving rest and comfort to the patient.

Concerning splints to be applied in the field, the utility of ready made bands and wires is mentioned, but some suggestions are made to be adopted in emergencies.

One is formed of wire, about a yard of which can be cut off any wire fence to be met with in most places, and can be shaped by hand, no pliers being essential. It is fixed to the military cap. It is applicable to a case where the front portion of the mandible is torn away from the posterior portions. The front fragment drops downwards, with the attached muscles of the tongue, impeding breathing and swallowing. When the splint is fixed, breathing becomes free and swallowing is facilitated. Moreover, the dangerous swelling of the tongue and neighboring soft parts does not occur. A ligature attached to the teeth is tied to the forepart of the wire. The designer (Hauptmeyer) has used it repeatedly in the field.

Cases in which the front portion of the lip and jaw are broken away and hang down should be supported by means of a sling of rubber dam fastened by strips of bandages to the military cap or to a bandage.

Bruhn is of opinion that splints should be made for each case, but he admits the utility of anchor bands and bars for application in emergency, as in field hospitals. At Dusseldorf, Germany, they are also used in cases where the

condition of the patient prevents an impression being obtained, but are regarded as temporary expedients, to be replaced later by other forms of splints. It is pointed out that one difficulty in the use of this form of splint is that the fractured surfaces often separate when the mouth is open.

The tin splint consists of two or three pieces hinged posteriorly. If there is any tendency of the mandibular fragments to lateral movement, guiding flanges are built up on one side or on both, inside which the maxillary teeth close. To wire the splint to the teeth, slots are cut in the lower border of the lingual and labial portions to correspond with the spaces between two teeth, say between central and lateral incisors of both sides. A wire ligature is then passed between these teeth, leaving a large loop lingually. The splint is then placed in position, and the wire placed into the slots. This is then pulled tightly; the loop lies in a horizontal groove cut in the splint. The labial portion, or portions, are then adjusted, the wire being placed in the labial slots, twisted tightly, and the ends turned down. If there be one or more spaces between the teeth, a hole can be drilled through both lingual and labial portions of the splint and the two fixed together with a bolt and nut.

The indication for the use of this splint is limited and confined to recent fractures with movable fragments, in each of which are several and fairly long teeth. The advantages claimed are the ease of its manufacture and fixation; the facility with which it can be removed for cleansing and reapplied. Bruhn states that, to satisfy the criticisms of visitors to the hospital, he has several times removed a number of splints, taken haphazard, which had been in place for many weeks. In not a single instance was the gum inflamed or red, nor could any effect upon the enamel be detected as would have been the case had the splint been made of vulcanite.

In the Berlin Hospital von Sauer's wire band, as modified by Schroder, is used. This is a single wire 2 mm. thick, of iron or, better, of aluminum bronze; to this the teeth are ligatured with fine aluminum bronze wires. If one side of the mandible is tilted inwards the wire is fitted closely and ligatured to the normal side, but is away from the teeth on the displaced side. Traction is exerted on the displaced side by rubber bands passing from the wire to the teeth, just as on applying an E. Plain arch.

From this paper you can see what position the orthodontist can fill in the carrying out of the treatment of gunshot wounds of the face.

DISCUSSION

Dr. Cavanagh.—Dr. Solley's paper is strictly up to date and in keeping with the times, and it gives us a foretaste of what is going to come to us when this war is over. With the amount of surgery being done at the present time, unless we take the hint and limit our practices to those who are under eighteen years of age, we are going to have many mutilated cases of malocclusion after the return of these men. Our opportunities for patriotic service will probably continue for a long time after the war is over.

Dr. Carter.—I am hardly prepared to discuss this paper intelligently. Dr. Solley has certainly covered the subject very thoroughly, and it shows he has gone into this particular kind of work to a great extent. I have followed the work being done in Europe, somewhat, through our dental magazines, and I have been impressed with the belief that the practice of this particular kind of work has been revolutionized, and the experience the boys who go over to France are getting, is going to be of tremendous advantage to the dental profession all over the world. The American dentists especially have been

covering themselves with glory. I have heard directly that some of the surgeons in France have almost marveled at the operations the American dentists are carrying on, and they have been astonished at the results obtained. As a consequence, the standard of American dentistry (which has always been high in Europe) is increased to a considerable extent.

The experience that a man on the front would get in a very few months, or in a year or so, would probably be more than he could possibly get ordinarily in a lifetime of experience in general practice. Inasmuch as this work seems to be within the field of the orthodontist to a great extent, I believe that Dr. Solley's paper is timely, and that it might be of advantage to many of us to look into this particular line of work a little more thoroughly then we have done in the past.

Dr. Scott.—There is no question but oral surgery is within the scope of the dentist and of the orthodontist. It is conceded these days that the average medical man is incapable and does not possess the knowledge to cope with the situations arising from fractures of the jaw, superior or inferior. Almost weekly—almost daily in fact—cases come under our observation that show that medical men in dealing with fractures of the mandible are handicapped by a lack of knowledge, not of the anatomical parts of the region involved so much as to what they are subject to. I think sooner or later they will revise this. The dental man possesses more specialized knowledge than the medical man, and therefore it is within his scope to handle these cases. A year ago I had the pleasure of listening to some talks by two doctors of Harvard University, who had returned from the western front of Europe, and their talks and pictures were exceedingly interesting. They had handled cases in the hospitals near the front. I remember the account of one patient particularly, where the superior maxilla had been almost entirely shot away, and the doctor, being very ingenious as a prosthetist, had arranged a device which to me was very novel, and I believe it was so regarded by almost all the audience. It resembled a pair of spectacles more than anything else. There was no way of getting attachment to the upper jaw. So he used two pieces of metal, which passed backward and over the ears to hold the appliance in place. As he said, it was not particularly beautiful, but the patient, through its use was permitted to masticate food to a certain extent. I think he also had a restoration of the nose, which formed a part of this appliance,—all of which he showed by photographs.

Dr. Solley.—Personally am much interested in this side of our specialty, and probably through the fact an opportunity was offered me several months ago to go in this capacity. When that offer was made I realized I lacked the experience. I would not have known where to turn nor how to handle these cases had they been presented to me, and the only thing left me was to perfect myself along these lines, as I feel personally, the need is coming and that the need will be great. In the last six months I have put myself in the hands of two prominent surgeons in this city, who have been kind enough to assist me in several minor operations. Thus I am trying to perfect myself in the technic of this work. I have carried on many cases here, the character of which permitted me to follow out any ideas I might choose along these lines.

THREE TYPES OF FRENUM LABIORUM

By Martin Dewey, M.D., D.D.S., Chicago, Ill.

Head of the Department and Associate Professor of Orthodontia in the Dental Department of the University of Iowa.

THE frenum labiorum is composed of mucous membrane and connective tissue located at the median line of each lip, and unites the lip with the gum. In ordinary conditions the frenum labiorum exerts a certain restraining influence upon the lip and only in certain abnormal developments does it become a factor in the production of malocclusion. When the frenum becomes of sufficient size, or has such peculiar attachments as to produce separation of the central incisors, we then consider it abnormal. The cause of the abnormal attachments of the frenum has not received very much attention. In fact, very little has been said as to what has been the cause. Some writers have classed the abnormal frenum as being congenital, having been present since the birth of the individual, while others seem to consider it an acquired condition. From my observation I am led to believe that the abnormal frenum in some instances may be congenital and in others it may be acquired.

In explanation of the foregoing statement, we will say that if one will examine a large number of frenums in young children before the eruption of the deciduous incisors, one will find that in practically all of the cases the frenum is attached at the occlusal border of the gum tissue, or rather, at that portion of the gum which will be the gingival border when the teeth erupt. With the eruption of the deciduous incisors and the corresponding increase in length of the alveolar ridge, the teeth and gingival portion of the gum tissue and alveolar process grows occlusally and the attachment of the frenum assumes a higher point as regards the gingival margin of the gum. However, if as the teeth and alveolar process increase in length the frenum also grows occlusally, then the attachment of the frenum will persist between the incisors and consequently produce a separation of those teeth. Where we find the frenum separating the deciduous incisors it may be considered as a congenital condition, which has persisted in existing after the eruption of the teeth, by the fact that the frenum has grown occlusally as the teeth and alveolar process have grown occlusally instead of assuming a position more apical as related to the teeth. In those cases where the frenum seems to be acquired we find that the abnormal frenum makes its appearance about the time of the eruption of the permanent incisors. This is caused by the fact that as the permanent incisors begin to erupt and the alveolar process supporting those teeth develops, the frenum grows occlusally at the same time that the permanent incisors do; consequently, at the time of the eruption of the permanent incisors, we find the frenum has grown occlusally to such an extent that it assumes a position between the incisor teeth. In such an instance as that we may correctly term such an abnormal frenum as being an acquired characteristic.

In examining a number of frenum cases, we have found three distinct types which may be represented roughly by the following illustration:

In Fig. 1 we find a type of frenum in which the central incisors are separated an equal distance between crown and root; that is, the incisors occupy a proper vertical position in the dental arch and the apices of the teeth are separated as much as the crown. The frenum is of a certain width extending from the highest point of attachment down to the gingival margin. This type of frenum may or may not be associated with open suture. The frenum extends in between the teeth and lingually to a point slightly anterior to the anterior palatine foramen.

Another type of frenum is illustrated in Fig. 2 in which the frenum is attached at the gingival border of the gum between the teeth, and the attachment does not extend very far apically. The result of this gingival attachment is that the incisors are separated at the crown more than they are at the apex, making the crowns of the centrals flare away from each other.

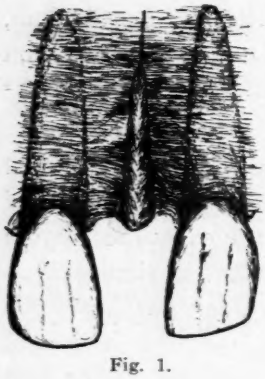

Fig. 1.

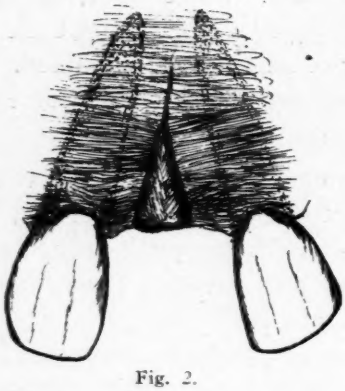

Fig. 2.

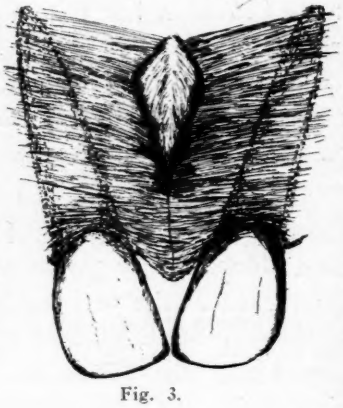

Fig. 3.

A third type of abnormal frenum is that in which the attachment is apical and does not extend entirely to the gingival margin. With this type we find the frenum runs in between the roots of the teeth and extends to the lingual border of the alveolar ridge, and by pulling the upper lip the fibers of the frenum can be seen to make traction on the tuft of gum which is anterior to the anterior palatine foramen. These fibers of connective tissue running through between the roots of the teeth in that manner produce a separation at the apex that is greater than that at the crown. In fact, the mesial incisal marginal angle of the teeth often approximates, while the apex of the roots diverge from each other to a great extent.

It will be seen when these three types of frenum are recognized that each one will have to be treated differently, both as regards operative procedure and as regards orthodontic treatment.

OPERATION FOR THE REMOVAL OF THE ABNORMAL LABII FRENUM SUPERIORIS

By Carl O. Engstrom, D.D.S., Sacramento, Cal.

THIS operation for the removal of an abnormal labii frenum was given in substance before the Pacific Coast Orthodontic Society in 1914. The following account of the technic is herein described more exactly, being illustrated by an actual case in practice. In contradistinction to other means this operation exemplifies the principle of complete removal of part of the frenum, following certain definite steps and the consequent definite degree of successful result. While confined to the one class of cases, other characteristics of attachment of the frenum would necessarily alter somewhat the technic of the operation presented and this much is left to the judgment of the operator.

Doctor Martin Dewey cites three classes of the abnormal frenum affecting the positions of the upper teeth.* First, that in which the central incisors are equidistant apart throughout their axial length as shown in Fig. 1; second, that in which the central incisors diverge toward the incisal region as shown

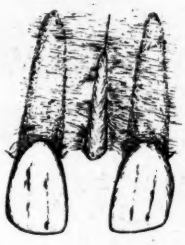

Fig. 1.

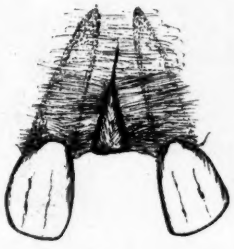

Fig. 2.

Fig. 3.

in Fig. 2; and, third, that in which the central incisors diverge in the direction of the apical portion of the roots as shown in Fig. 3.

The abnormal frenum mentioned above, as of Class 1, is usually present and the following description deals principally with that form. A photograph of the case is shown in Fig. 4. The frenum being more extended does not show the fullness as shown in Fig. 5. It will be noted that the lateral incisors have not erupted and the child is seven and one-half years of age.

An appliance of bands, vertical tubes and pins, and .022 wire was first constructed and adjusted as shown in Fig. 5. By this means pressure was exerted and the central incisors were moved mesially, but not into contact with each other. This was done to promote osteogenetic action. The wire with pins attached was then removed and the following day the operation for the removal of the abnormal frenum was performed.

In Figs. 6 and 7 the incisions are marked. A local anesthetic was used. By means of a cataract knife, incision *a* to *b* was made alongside of the frenum,

*See article by Dr. Martin Dewey, entitled "Three Types of Frenum Labiorum," on page 461 of this issue.

leaving a thin covering of tissue next to the tooth. Beginning this incision, the point of the knife was placed at a point on the process designed to be the inferior extremity of attachment of the frenum following the operation. The cut was made straight down to the bone and extended back to a line tangent to the cingula of the central incisors. Another incision was made similar to *a* - *b* on

Fig. 4.

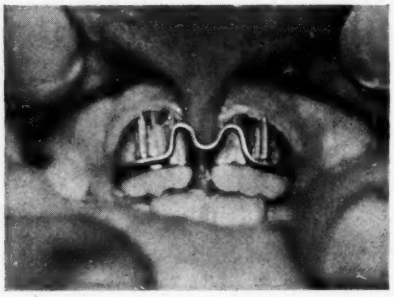

Fig. 5.

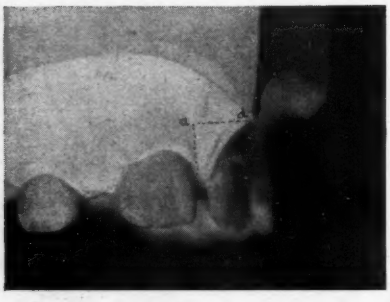

Fig. 6.

Fig. 7.

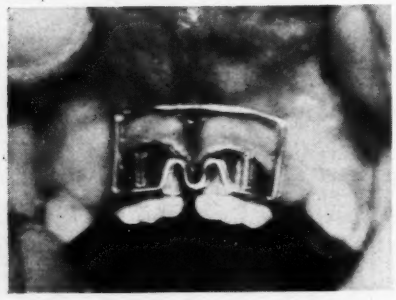

Fig. 8.

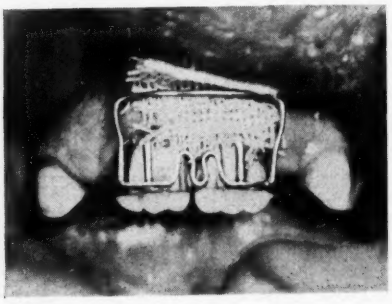

Fig. 9.

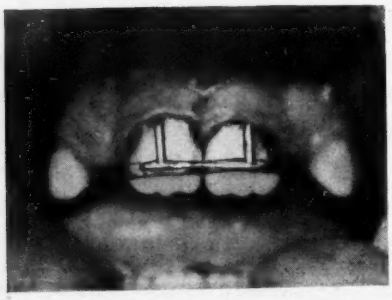

Fig. 10.

the other side of the frenum ending at *c*. With the end of the cataract knife the fibers of the frenum were severed from their bony attachment, beginning with incision *c* to *b*. As this was done the frenum was withdrawn from between the teeth by tension, effected by holding the lip. The fibers were found to be attached up as far as the point *a*. The fibers having been severed, and the tension on the frenum being thereby released, the frenum retracted and stood out from the lip but a comparatively short distance. This part of the frenum *d* to *a* was then severed from the lip with a pair of small scissors. No tension was exerted on this part of the frenum in the cutting and as a rule no stitches are necessary. A wire was added to the ends of that shown in Fig. 5 and illustrated in Fig. 8. Adjustment was made to move the central incisors into juxtaposition. The illustration is not quite distinct due to movement of the patient during the photographing. A piece of gauze was doubled and placed under the wire extension as shown in Fig. 9. A one-half per cent solution of chlorazine (Abbott) was flowed over the gauze and incisions, and as the lip was released

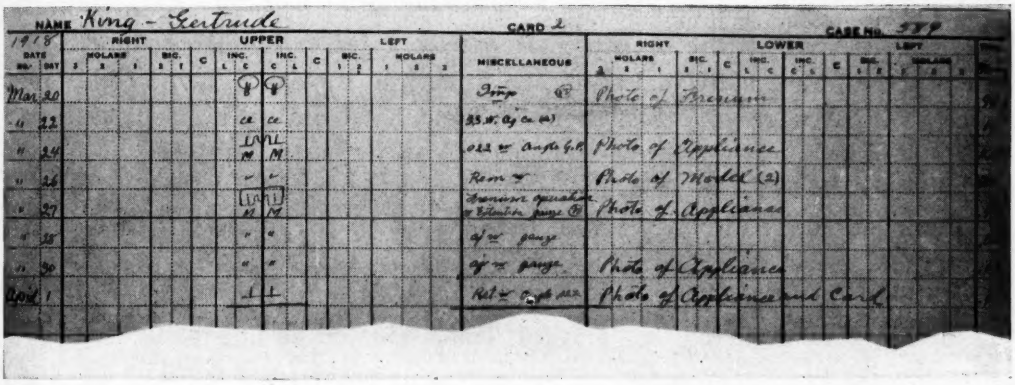

Fig. 11.

the gauze was folded preventing a reattachment of the tissues. Instructions were given regarding the cleaning of the gauze and cut surfaces with a one-half per cent solution of chlorazine before and after meals and at bed time, using a water syringe.

Fig. 10 shows wound healed and teeth in proper position with retaining wire. The retaining wire is to be removed when proper support is attained from other teeth.

Fig. 11 is an illustration of the record of treatment. The bands, tubes, wires, and their positions are shown. Under heading "Miscellaneous," the *n* encircled designates notes on the reverse side of the card. On March 27 movement of the teeth bodily and mesially is designated by the letter *m*. It is presumed the other markings will be understood by reference to the description given above. On account of the photographs being taken, more time is recorded than would otherwise be necessary.

This operation commends itself because of its definite procedure and results, its simplicity and the short time in which it may be performed. As a rule the little patient is not cognizant of what is being done.

OUR MORAL RESPONSIBILITY*

By Dr. Charles C. Mann, Seattle, Wash.

IN presenting this paper for your consideration it has not been my purpose to elucidate any pet theories but merely to place before you some conclusions of men who have made exhaustive study of the child in his physical and mental development. Children have always been objects of care and solicitude to society and the importance of the laws that govern the growth of the body and mind is obvious to even the most superficial observer.

"Modern biological psychology conceives of a human being," says O'Shea in *Dynamic Factors in Education,* "as most delicately responsive, alike in a mental and in an organic way, to every aspect of his environment. All of his experiences, even to the very least and inconsequential, affect him for better or for worse. Every force that plays upon him be it ever so slight, probably heightens the tide of life or depresses it. Regarded from this standpoint the sole concern of the individual should be to keep in contact with the child those forces which confer greater strength on him, that build up his organism, and avoid those that tend toward destruction."

This being true, we as orthodontists, are assuming a measure of responsibility in our daily association with the children placed under our care, in the mental and moral development as well as the physical and it is meet that we should heed that responsibility.

It has been observed that marked fluctuations occur in growth, especially after the age of six years, the periods being more sharply defined in the male than in the female child. It is said that up to the period of adolescence the child lives more the race life, that at adolescence a strong development of traits ensues and thereafter the child becomes more individual.

At about the time of the beginning of the permanent dentition, the brain is rapidly developing the fibers of connection between its various parts and as a result a marked mental change occurs. The child's interests are greater and more diversified, he plays more games and makes more friends. The senses become more active, observation keener and the development of interest in persons with whom he is associated and the effect of their precepts and example more marked.

Professor Tyler says "He is now observing subsconsciously and without much logical thought. He learns through imitation and suggestion without knowing that he has learned. He acquires at the same time their peculiarities of dialect, of idiom, pronunciation and inflection. He imitates the gait and manners and almost any striking peculiarity of parent or teacher with like results. Not only the habits of speech and action but preferences and aversions, prejudices and superstitions, esthetic and moral standards; even religious tendencies arise, grow and take form as a result of surrounding conditions; he

*Read before the Pacific Coast Society of Orthodontists, San Francisco, Calif., February 18-19, 1918.

knows not how. But these habits of thought, speech and action soon become fixed and unchangeable and fashion his whole life.

"The child's standards of right and wrong are purely personal determined by the results of his actions and therefore dependent upon his surroundings," says Professor Norsworthy of Columbia College and Professor Kirkpatrick says "He is greatly influenced by individuals. Spontaneous imitation leads the child to imitate everything that attracts his notice whether profanity or prayer, caresses or cruelty, rudeness or politeness."

"It is the season for the most momentous and potent influence for good and evil," writes Bourne in "Youth and Life.".

So we may go on and on with similar suggestions from these and other noted writers and educators all pointing to the same facts in the life of the developing child. And we have our part in the shaping of these developing characters. Our association with children under treatment extending as it does for a year, two, three and even more, must have its certain effect upon them and it should be our earnest endeavor to exert at all times an influence for good alone.

O'Shea says that teachers and professional people are rather more tense and rigid than most other people. This, if true, is unfortunate as these disorders are contagious. If your nerves are edgewise and you show it in features, voice or bearing, if you are fussy and irritable, those who associate with you are affected and develop your neurotic condition.

Association with nervous hypochondriacs overstimulates other individuals, while on the other hand well poised, well nerved people tend to bring about mental equilibrium.

For one whose work develops overtension the practical remedy is to fill his life with upbuilding ideas and influences. Well selected books that rest and soothe the mind, taking it away from the daily problems, and good music have always been effective in neurotic conditions. A strain of music will change the entire current of thought.

Fatigue has much influence on these neurotic conditions, and is evidenced by tenseness and rigidity. Then a restlessness ensues to relieve the tension, this is nature's way of relieving the strain on the central nervous system. These manifestations in the operator will reflect themselves in the patient and should be avoided. Fatigue is not so much the result of the work of any given effort, this may produce a temporary fatigue which your nerve force overcomes within a short time, but that fatigue to be avoided is the result of too close application over a long period of time without adequate rest and adequate play. Play, gentlemen, is as essential to you now as it was in your youth. To me it seems that, as I grow older, it becomes more necessary to maintaining efficiency. Regular periods of recreation, preferably out of doors, at the sport which suits you best, will result in better health, better nerves and longer, more efficient, life.

Among the phases of environment which exert marked influence upon the human organism are form and color. Experimental science has made some analysis of these influences. It has deduced that beauty exists because the form which the individual regards as beautiful causes agreeable responses

within his organism, and the impression of ugliness results from the opposite set of influences and responses. Color is known to be stimulating, soothing or depressing upon an organism and has a distinct psychological effect.

There are so many angles from which this subject of child development may be studied, so many things to be observed and considered, each child being, as it were, an entirely new problem, that these phases of environment and association with their effects are well worth our earnest thought. Each of us who has the care of the man or woman in the making, should recognize the responsibility devolving upon us, and strive to bring about within ourselves a state of mental equilibrium.

"If you achieve calmness and harmony within your own person, a wave of imitation will spread from you."

DISCUSSION

President Cavanagh.—I think the Society will agree with me we have listened to a paper which has required many hours in its preparation. It deals with matters that may rarely occur to many orthodontists. The "Psychology of the Child" is something that should be incorporated in a progressive school of orthodontia, inasmuch as we are more and more dealing with younger and younger children—at ages when they are most impressionable. Further, we are working under a nervous strain, and we may so arrange our surroundings, our office fixtures, the decorative scheme, etc., as not to be conducive to relaxation, and this reacts not only on ourselves but on those coming into the office. Every person entering a professional or business office is impressed favorably or unfavorably, irritated or rested, by the surroundings. Personally, if I go in a room where the pictures are hung on the wall at an angle or placed in an inappropriate position, I do not rest very comfortably. Those things are affecting us at all times, and if we place ourselves where something irritates us that unconsciously irritates those whom we serve, and more attention should be paid to this matter. In the way of environment, I believe certain malocclusions are produced by a child's surroundings inasmuch as they show similarity in voice, features and various expressions of those whom they admire. I believe certain Class III cases are produced through the imitation of the child,—through the fondness of the child for a grandparent or a parent in whom this type of malocclusion was present.

Dr. B. Frank Gray.—It is safe to assume we are all fond of children. I believe an orthodontist who is not, would manifestly be a "misfit." It has been my pleasure to note in visiting many of my friends in the specialty, there was a most beautiful relation manifest between the doctor and his little patients, a relation quite like that existing between a fond father and his child. That I believe to be the proper attitude. It is not a part that can be merely assumed, for there must be the real love for children in the heart of the orthodontist.

I feel Dr. Mann's paper is an appropriate one indeed, and we will all do well to think more along the lines he has brought to our attention. Not having read the paper, I do not feel competent to adequately discuss it. I am glad we have had the opportunity of listening to it.

Dr. Millberry.—Mr. President and Gentlemen: In listening to Dr. Mann's brief and meaty paper, I have noted his impression that there is so much in the environment of a child's life that has its effect psychologically and physiologically on the child that may materially influence its growth or possibilities in after life. That is the most striking thing in his paper. In recalling a statement made yesterday as to the influence of heredity on certain conditions, and then listening to some of your own individual views in regard to social contacts and family contacts and their influence, I wonder, in listening to Dr. Mann, how far environment will go toward bringing about or correcting conditions that are of paramount interest to the growing child. His resume typifies a very intensive reading in child psychology particularly, and the influence of the surroundings and environment on children. We have each one of us his contacts. For instance the doctor's mention of color. I think the American flag gives an expression which may be subconscious, but there is a certain impulse conveyed to the brain as a result of the color sense, through the eye.

And how much more important that can be made if everyone were to study the matter of color influence on the children, and the effect colors give to children. That is most manifest in dress.

Most people enter a dental office with a sense of fear. If that can be obviated by an arrangement of office equipment, and all the other conditions which influence the welfare of the growth of the child can have attention, how helpful it would be. I am conscious that some of you resort to certain forms of entertainment for the children which overcomes tension and fear. Those influences are important.

As I listened to Dr. Mann's address with regard to orthodontia, I wondered how much more far-reaching this might be in the problem of dental hygiene. Would it not be a worth while thing that child psychology might be taught our dental hygienists in the courses given in that work? Especially it would seem important to those women who expect to become children specialists. It is one of the interesting possibilities of the future.

All these things brought out in your papers today,—these professional contacts, have given me a greater inspiration to go on with our work in the field of dental education, in the hope of leaving no field untouched that is important to the child's welfare.

Dr. Suggett.—I would like to have had opportunity of looking over a copy of Dr. Mann's paper. It contains many points of keen interest. As to environment, I believe it has as large an effect over children as over adults, and I think we are pretty well convinced we must look to environment in what we are doing, not only as children, but as men, states and nations. We consider it now as never before. It has occurred to me, as to our patients, that the nearer we treat the child as a grown person the better. We should not come down to the child, but treat him on a level with ourselves. If we talk "over the head" of a child, we often find they come up to it. Dr. Ottolengui spoke of taking the impression of a boy of six or seven years of age, and the little fellow said,—"Did you have to do this too when you were as little a boy as I am?" Dr. Ottolengui said, "Surely, but you are a big boy, and that settles it." So I try to cultivate the habit of speaking to the children as I would to their mother, sister or anyone coming with them.

I suppose one of the principal things is you really have to love children, and you can not fake it. As illustrating the notions of children, I may refer to a little girl whose father was most fond of her, but did not seem to appreciate how to talk to her nor how to entertain her. At the park, where we chanced to meet one time, we were going over to look at the bears. She said, "I wish you were my father and my father was my grandfather!" The father said, "That is the limit, isn't it!" He said he did not understand children and did not know what to say to them. He had no sympathy nor understanding of children.

In dealing with children, we must not force them. Absolute confidence is necessary.

Dr. Mann.—This subject has been one of great interest and importance to me for a long time. In the practice of dentistry, which I was engaged in for a number of years, I always adopted the plan, probably per force of habit, of maintaining a happy disposition about my affairs. Singing has always been to me a great pleasure, and in my work at the chair as a dentist, I always sang. I have continued the habit since coming into orthodontia. The influence of certain environmental conditions, of color, form, etc., has been brought to my notice in some ways which I did not quite understand. Recently I have had under my care a student of education at the University of Washington, an extreme socialist, and a man who has made an exhaustive study of developmental and environmental features of child life, and in conversation with him it occurred to me this subject has never been given (so far as I know) any consideration in the profession of dentistry, nor in the specialty of orthodontia in the manner of a paper, and I thought perhaps it would not bore you gentlemen too much if I brought it to your attention.

My office has a view of the entire Puget Sound. The sunsets are very beautiful from the windows. I doubt if you can go anywhere and find more beautiful pictures from day to day than from the windows of my operating room. It gives the children pleasure to observe these pictures; they comment on them and are pleased with them. The movement of the vessels in the Sound,—the manufacturing districts where the great ships are built and launched every day now, is always of great interest to the children. To me, a child who is under my care is as if he were my child. I do not agree with Dr. Suggett that a child should be brought up to your plane. You must study what the child likes and dislikes, his susceptibility under certain conditions, and if you do so you will find he will meet you as near your plane as possible, and your mutual understanding will bring about a much easier situation.

I have children who have been with me some years, and some only a short time,

and I want to tell you this, gentlemen, that I have more friends among the little folks that I really care for than I have among the older people. I can depend upon the word of those children just as implicitly as I can depend on the word of my own boy, and so it has been a great pleasure to me to take up this subject as a matter of thought and consideration. I have studied it carefully, and have found the cooperation afforded me by my patients has been a wonderful thing.

If a child comes to me with an unclean mouth, the first thing he does is to apologize for the condition of his mouth, and the children will do so in ninety-nine cases out of a hundred. There is little trouble, after once having instructed the patient as to prophylaxis, to get cooperation.

I think the educational feature, as Dr. Millberry has brought it to your attention, is a wonderful thing, and I think the incorporation of some such idea in the educational institutions will give the young men going out into the profession a better understanding as to these considerations than they can obtain in any other way. Too many enter the profession of dentistry with the idea their dignity should be the first consideration and that it should not be overstepped by anybody. It is beneficial when properly applied, and disastrous when improperly applied. It is easy enough if you have yourself well in hand,—well poised, with flexible minds, to be dignified in all cases requiring dignity, and otherwise it may not be.

I think all of you gentlemen will agree with me after you have gone back to your homes and taken up your work with the children, that a consideration of each child will be of the utmost importance to you in your work.

WHY THE MALOCCLUSION SHOULD BE CORRECTED DURING THE ERUPTIVE PERIOD OF THE PERMANENT TEETH*

By J. W. Rawlings, D.D.S., Tacoma, Wash.

I WISH to make the assertion at the outset of my paper, that the correction of malocclusion should be made during the eruptive period of the teeth. What I mean by the eruptive period of the teeth, is the period between the eruption of the first permanent molar, usually about the fifth to the sixth year, and the eruption of the second permanent molar, usually about the twelfth to the fourteenth years.

It is during this period we obtain our best results, both in the occlusion of the teeth and in the facial lines. However, the orthodontist must accept his patients as they come to him, and this in a measure accounts for the various results obtained. The ideal time in life to commence corrective measures is about the eighth year in life, and if our cases could be selective this is the time we would most desire them. Dr. Lischer has very aptly termed the age from eight to twelve as the "Golden Age" of orthodontia, for the beginning of treatment.

The eruptive period is the critical age for the child for it is the period that the dental arches and adjacent parts either develop in a normal or abnormal degree. It must be understood that malocclusion is progressive in its development; i. e., when one tooth gets out of alignment in the arch, the intimate relationship, dependence and interdependence of one tooth to another, is destroyed,

*Read before the King County Dental Society, Seattle, Wash., April 2, 1918.

and the arch as a whole continues to develop in an abnormal manner up to the time of the eruption of the second permanent molar. There is also an intimate relationship between the normal development of the arches and the jaws; the bony and soft adjacent tissues of the face. This is markedly noticeable in the facial lines. We quickly observe in looking at the features of the child whether there is harmony or inharmony in its development.

The inharmony almost invariably has its beginning from the maldevelopment and irregularities of the teeth. I have given some reasons for the early correction of irregularities of the teeth and now I wish to give you a few reasons why it is advisable to commence the correction of irregularities during the eruptive period.

1. At this time in life the alveolar process is not very dense, and the teeth respond more readily to pressure.

2. The alveolar process not being dense at this age, permits using more delicate appliances which give that easy pressure which experience has shown stimulates cell activity, and the success of orthodontia is fundamentally due to cell activity, for it is through this force that we are permitted to move and retain the teeth.

3. After the crown of the tooth has shown through the gum tissue it is easier to direct it to its normal position through delicate pressure than it is to permit it to take its irregular position and then commence its movement to its normal position.

4. Teeth directed to their normal position during the eruptive process are much more easily retained than those taking irregular positions and then moved to the normal position.

The rationale of this is that the eruption of the tooth consists in the forcing or the elongation of the teeth through the gum and the development of the alveolar process and peridental membrane around it for its retention.

By directing the tooth to its normal position during its slow progress of eruption through the gums and bone we are taking advantage of nature's method of retention.

I desire, if I may, to firmly impress this upon the general practitioner, for I believe the great problem in orthodontia is not in the movement of the teeth, but in their retention. And anything which makes this easier, certainly adds to the more permanent success of correction.

5. There are certain types of irregularities; i. e., the protruding types, Class II—Division I—and Class III, (Angle's classification) that greatly mar the facial balance. There are various degrees of these types and some of them can be safely termed facial deformities. It is more the correction of the features in many of these cases that is desired by both patient and parent, than the correction of the teeth. And if operative measures have not been started early it is impossible to get ideal results. For instance, in a typical Class II—Division I—case, you will have an underdeveloped upper lip and an overdeveloped lower lip. If the lips are permitted to develop in this way, operative measures of the teeth can not possibly change this development of the lips and it will continue to mar the features throughout life. However, if the orthodontist can commence corrective measures early in life before the abnormal develop-

ment of the lips has taken place, with the removal of the adenoids and the correction of the teeth, you will produce a condition whereby the child can breathe normally, and the lips will develop normally, and you will produce a harmony and balance of features which is so satisfactory to both patient and operator.

I have attempted to tell you when corrective measures should be resorted to, and why; and I trust I have made that plain to you; and now I would like to unfix, as it were, the idea which seems to be so firmly fixed in the minds of so many general practitioners, that the time to commence orthodontia treatments is after all the permanent teeth have erupted. Dr. Brady paraphrases this advice to letting the teeth develop in the irregularity to as complicated a condition as they can possibly get, then start in to correct them, instead of catching an individual tooth, which is so often the beginning of the irregularity; and correcting it thereby bring about normal condition, and permitting the arch to develop under these conditions. Every orthodontist is continually annoyed by the parent remarking that the family dentist had examined the mouth and had advised the postponement of operative procedure until all the permanent teeth are erupted.

It is beyond my comprehension how this prevailing idea has become so fixed for I can not find any of the standard textbooks on orthodontia advocating any such procedure. So it is the duty of the general practitioner as well as the orthodontist to advise and educate the public that to obtain the best results in the correction of the teeth, and facial lines, the corrective measures should be administered during the eruptive period.

The general rule should be, the younger the patient the easier and more sure the result.

THE HISTORY OF ORTHODONTIA

(*Continued from page* 430.)

By Bernhard Wolf Weinberger, D.D.S., New York City

THOMAS BRIAN GUNNING, before the Seventh International Medical Congress, 1881, (Vol. iii, page 548, proceedings), presented the following paper: *"Causes of Irregularities of Position of the Teeth,"* under which he said:

"The most trusted teachers and writers upon irregularities of the position of teeth ignore the facts of Nature, and teach others to work, not only outside of, but in opposition to, her processes.

"At the seventh week of foetal life the germs of the teeth begin to start from the mucous membrane, which lies between folds somewhat firmer than itself; and by the thirteenth week the papillæ of all the deciduous teeth are enclosed in open follicles. At the fifth month, the germs of the ten anterior and of the first molar teeth of the permanent set start; and as the deciduous teeth with the sacs of the ten permanent ones grow, and take up more space, the permanent molar is forced into the tuberosity of the upper jaw, or into the coronoid process of the lower. They occupy these positions until the eighth or ninth month; during these two months, the basilar portion of the lower jaw, which supports the alveolar process and teeth, and also gives attachment to so many muscles, is rapidly developed; yet at birth it is comparatively incomplete.

"In nursing, the upper jaw is supplemented by the lip, the nipple being held against the roof of the mouth by the stronger and more active lip, assisted by the less-developed jaw. This keeps the lower jaw back, and the upper jaw projecting, in accordance with the earlier development of its teeth in foetal life. In general, the central incisors of the lower jaw appear first; but when those of the upper come, they are soon joined by their lateral neighbors, the lower lateral incisors emerging later from the jaw, which is still without bony union at its symphysis. Thus, the lower teeth are kept back inside the upper. The lower jaw is more easily observed than the upper; it is therefore, referred to in preference.

"The deciduous set of teeth which begin to appear about six months after birth, are by three years of age arranged in the mouth. At six years the lower jaw is seen to be much deeper and larger in every way, as it holds the temporary set of teeth and also the permanent, so far as developed.

"The jaw generally lengthens until three large molars have come through on each side behind the semicircle which held the deciduous set. The third molars come down like the second and first molars into the dental range, the horizontal portions of the jaw growing an inch or more in front of the ascending ramus in the lower jaw, and an equal length in the upper jaw.

"It is apparent that from the start the vital force is specially exerted to perfect the teeth, and form the jaws for their protection and arrangement in

the mouth. The alveolar process develops with the teeth, and the basilar part of the lower jaw, which grows rapidly just before birth, continues to enlarge in proportion to the development of the teeth; this is shown clearly in its growth to admit the permanent molars.

"Now all this change of the jaw from before birth until adult life is in connection with the development and arrangement of the teeth; and enough has been shown to prove that the growth of the jaws is generally controlled by the development of the teeth."

Gunning then showed that the size and the shape of the jaws may cause irregularities of position of the teeth: (1) Diseases of the teeth may cause irregularity, when, except for it, all would be normal. (2) Premature loss of temporary teeth more than undue retention of them, causes irregularities. (3) Disease of one or more of the temporary or permanent teeth, or loss of either may deform the lower jaw and also displace it. (4) Mistaken views in respect to the treatment.

"In cases of projection of the lower jaw, caused by muscular action drawing the condyles toward the eminentiæ articulares, a plate which projects out from under the upper incisors down in front of the lower, will gradually press the jaw back, and, at the same time, it may be used to correct the positions of the teeth which caused the jaw to come forward. Or, if required, a plate on the lower teeth will throw the jaw back.

"A projecting jaw, which is well seated in the glenoid cavities, can not be pressed back by any apparatus in the mouth, nor by any outside around the head and jaw, whether as pictured in the books or otherwise. If the condyles were pressed back from their natural position, the ears would be closed.

"Except for the relation between the teeth and jaws, and for the changes which are usual to them in the earlier years of life, the most intelligent treatment could be of little avail in preventing or in remedying malformation.

"The fact that when the teeth are lost the jaws are still able to act in functions other than mastication is no justification of the misleading statement that the teeth and jaws are independent of each other.

"If the teeth, as a whole, are too large for the jaw, they should be kept in to encourage the growth of the jaw, as long as this can be promoted, and then such of them extracted as can be best spared to make room for the others. If a jaw is too large prospectively, remove the necessity for its growth, whether in the least important teeth, or in their position, and especially guard against habits which tend to this deformity.

"If irregularity be treated by appliances, they should act naturally; those just prescribed press the teeth either through their own growth, or similarly; when the jaws close, they give the shock usual in natural movements, but upon the intervening appliance. Thus, if the teeth are moved, they are never lifted from their sockets. The teeth, as a whole, support each other, or are affected naturally, and are not moved unnecessarily in other functions. This is especially so with these regulating plates, they having gold hooks imbedded in them, and being used without anything more elastic than hard wood, which deprives each tooth by direct pressure; in this way the apex of its root is carried out with its crown, especially in the lower incisors and the upper laterals, whose thin

roots move readily in the alveolar process, when their crowns are held back by the adjoining teeth, or their cutting edges restrained by gold hooks."

Here we observe Gunning noticed as early as 1881 the bodily movement of teeth; "the apex of its root is carried out with its crown."

J. Oakley Coles before the same Congress spoke *On the Origin and Treatment of Certain Forms of Irregularities of the Teeth.* He referred to his classification of deformities of the upper jaw, already described, as well as a consideration of the influence of the antrum in regard to certain irregularities of the teeth, and was of the opinion that an irregular growth of the external wall of the antrum was a cause of "hypognathism." There was a relation between this the sphenoid, premaxillary bones of the antrum, in reference to dental and maxillary irregularities of form and arrangement. He then considered certain points in the mode of treatment:

"(1) If expansion is tried it should be expansion of the jaw with the teeth in situ in the first instance, and regulation of the teeth individually as a subsequent operation, rather than expansion of the dental arch by pressure applied to the teeth and their alveoli. (2) And next the desirability of extracting the teeth that are out of position, and then restoring the contour of the arch by expansion. This treatment, of course, applying only to the more severe cases."

Joseph Iszlai (*Proceedings of the Seventh International Medical Congress,* page 555) read a paper, *"Illustrating Sketches to Carabelli's 'Mordex Prorus' and its Relation to 'Prognathia Ethnologica' and Meyer's 'Crania Progenæa.'"*

Exact determination of objects and their nomenclature is important. He attempted to prove by a critical survey of Carabelli's work that the different types of closure of the anterior teeth regulated this, and Carabelli's lack of exact determination interfered with his classification.

He proposed a new nomenclature according to the various ways of "biting" as well as to the anomalies of the position of the teeth. The description of Wedl, Baume, Mühlreiter, Carabelli, Magitot and other authors lacked clearness and understanding.

J. W. Smith, before the Harvard Odontological Society, (*Cosmos,* 1881, page 224) spoke *On Relations of the Teeth and Surrounding Tissues in the Correction of Irregularities,* as follows:

"Since the difficulty of correcting dental irregularities increases with age, as soon as it becomes evident that a permanent deformity exists, treatment should be commenced without unnecessary delay. This is appreciated by the dental profession, but, from various causes, many cases are neglected until at or beyond maturity before advice is sought. When thus deferred, the correction of the irregularity is often difficult, and the results of treatment are frequently uncertain. What I have to offer with reference to lessening this uncertainty is the result of some study; limited experience has seemed to confirm my conclusions.

"We have no definite knowledge of the chemico-vital processes involved in the solution of bone under any circumstances. As manifested in correcting irregularities, the process seems to me quite analogous to the absorption of bone during the formation of callus in the healing of bone fractures. Dr. Theodor Billroth suggests that in this process there may be developed lactic acid, which

changes the carbonate and phosphate of lime into soluble lactate of lime, which is taken up and removed by the vessels. But this is only hypothesis.

"By means of the appliance shown in Figs. 1 and 2, the left superior first bicuspid, cuspid, and lateral and central incisors were moved to the left sufficient to almost entirely take up the space left by the extracted bicuspid, and enough to make room for the overlapping central incisor. On account of its

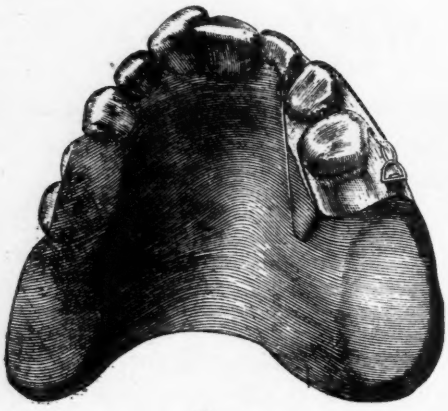

Fig. 1.

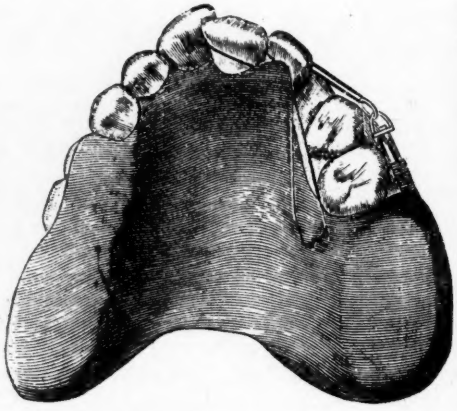

Fig. 2.

Figs. 1 and 2.—J. W. Smith's appliances for the correction of irregularities of the teeth. (1881.)

Fig. 3.—Key used to turn screw as employed by J. W. Smith. (1881.)

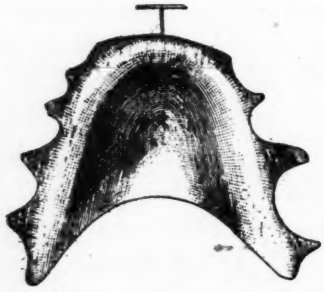

Fig. 4.—Retaining plate used by J. W. Smith. (1881.)

strength, Japanese grass-line was used instead of silk or linen in connection with the plate and screw. This appliance was entirely under the control of the patient. It was removed once a day for cleansing, and the screw tightened once in twelve hours. Fig. 3 illustrates the key used to turn the screw. The prominent central and the depressed lateral incisor were easily moved by simple means.

"A retained plate (Fig. 4) holding in position the right central incisor, is all that is now required."

(*To be continued.*)

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

THE USES OF THE X-RAY IN MODERN DENTISTRY AND MEDICINE

BY JULIAN A. ZABROCKI, PH.G., M.D., D.D.S., CHICAGO, ILL.

THE x-ray was discovered by William Conrad Roentgen in the year 1895. Several years later the dental profession first became aware of the wonderful diagnostic aid, and the almost unlimited use of the x-ray in the practice of dentistry.

The past eight years mark the greatest advance that dentistry has ever known in any like period. It represents a period of better and more scientific dentistry. The hour has come, when through the aid of the x-ray, we can see the results of our work and efforts. We can judge the value and merits of our endeavors; also, we can view our prospective field of operation. Never in the history of the world has the dental profession progressed as rapidly as it has in the past few years.

Dentistry as a profession is now in such an advanced position, that the Chief Executive of these United States of America—our most beloved President Woodrow Wilson, has officially recognized the dental profession as a branch of medicine, and rightly and justly put us on par with our medical brothers, with the same rank, privileges and retirement in the army and navy.

The dental profession can not stop and wait for the laggards, it is moving along with the impetus it has gathered, but in moving along, it offers educational opportunities in every direction to all who will but seek them. Our society and club meetings are entitled to be considered as postgraduate courses. Our dental and medical journals teem with information from the pens of the best men in the profession. There is no excuse for any dentist to lay blame to anyone but himself if he is not familiar with the leading thoughts of the day.

The time has come for the maintenance of health, happiness and efficiency of the present aggressive and progressive generation of men and women. The hour has arrived when the dental profession can realize and fulfil the prophecy of the famous surgeon, Doctor Mayo, of Rochester, Minnesota, who recently said that the next great step in preventive medicine would come from the dental profession.

I honestly and sincerely believe that the dental x-ray as a diagnostic aid and adjunct to dental and medical practice will do more than any other single medium to enable the fulfillment of this prophecy.

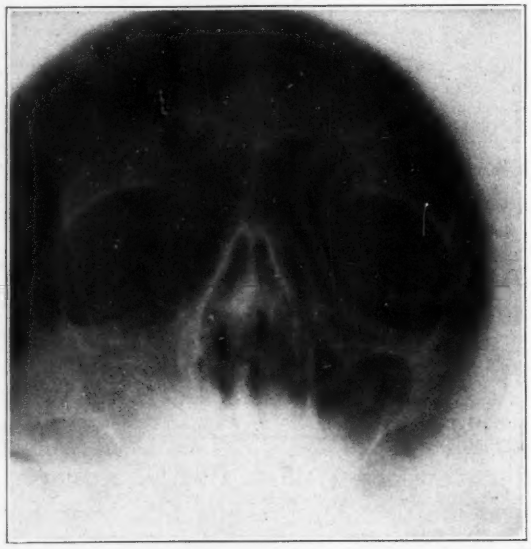

Fig. 1.—Opacity due to empyema of left maxillary sinus.

Fig. 2.—Upper right lateral incisor shows root filling passing through apex into large periapical area of chronic rarefying osteitis with ragged edges indicating a suppurative process. Pulp vital in central incisor, the apex of which extends to edge of area of disease.

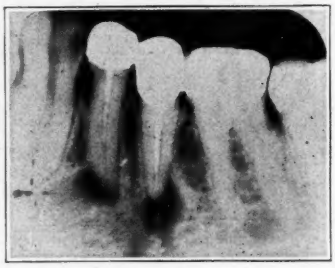

Fig. 3.—Lower right canine, caries of distal surface of crown. First and second premolars crowned, partial root fillings, periapical chronic rarefying osteitis and granuloma.

There is no subject in the whole field of radiography, that is so full of interest to the various specialties of medicine and surgery as that concerning the use of x-ray in dental and medical practice. The dental radiograph offers its utmost service as a means of detecting and locating focal infections with pathological conditions of the teeth, jaws and adjacent tissues of the oral cavity, which are established as etiological factors of constitutional conditions or secondary lesions, localized almost anywhere in the entire body.

These secondary effects or lesions include gastrointestinal disturbances, appendicitis, pains in the head or neck, neuritis, myositis, arthritis, inflammatory lesions of the eye, endocarditis (heart lesions) rheumatism, abnormal mental conditions, such as melancholia, irritability, insomnia, neurasthenia and temporary insanity. In the presence of any one or more of these conditions, a complete x-ray examination of all the roots and teeth is indicated, before dental procedures are attempted.

The dental x-ray is not a fad as some of the old timers are inclined to believe, but an absolute essential, and necessity for correct diagnosis. As a mat-

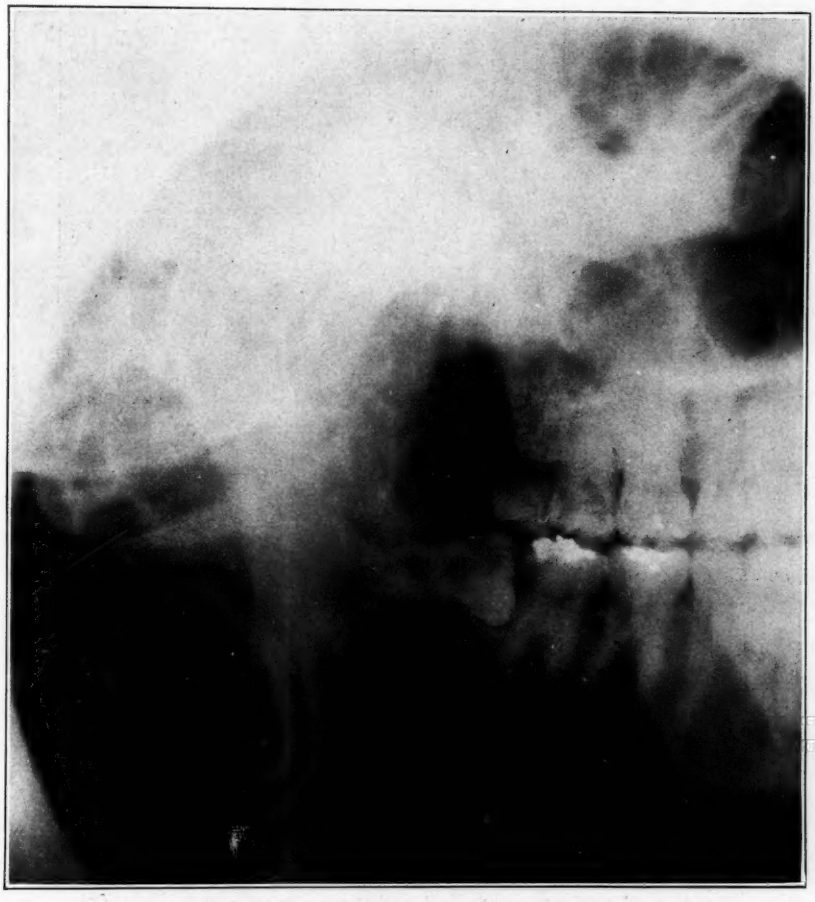

Fig. 4.—Horizontal impaction of lower left third molar.

ter of fact, many of the best diagnosticians in medicine and dentistry insist upon complete, full mouth, x-ray examinations of every patient presenting himself for treatment.

You can see from the diversity of the diseases I have mentioned, that practically all the branches of medicine and surgery are affected, and they must accordingly all be interested in dental radiography.

The need of absolute cooperation of all the specialties of medicine and surgery can not be overestimated. In the first place, the dental conditions that cause the more serious secondary disturbances are not always associated with

the important local subjective symptoms of pain; if they were, the patient would immediately seek the attention of the dentist, and treatment would be instituted before other harm resulted.

Many of these painless dental lesions are discovered in the course of routine radiographic examinations made at the instance of the physician, internist,

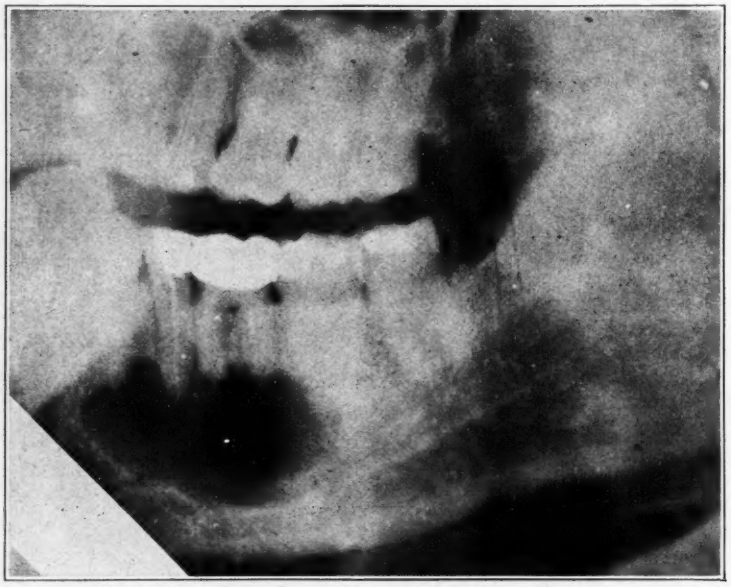

Fig. 5.—Large area of bone destruction on right side of mandible due to cyst formation probably arising in connection with irritation following periapical infection about the second premolar and first molar. Observe sharp outline of cavity.

Fig. 6.—Periapical bone destruction connected with lower left second molar. Patient, fourteen years of age, had lost first molar on that side some years previously. For several months had had a sinus discharging through the skin just below the lower border of the mandible. The second molar appeared normal except for a large filling. On extraction of this tooth a dead infected pulp was found.

The crowns of the unerupted upper and lower third molars with undeveloped roots are shown. Upper third molar of opposite side is seen as a light area above the premolar region.

neurologist, orthopedist, ophthalmologist or other specialists to whom the patient appealed for relief, because of the symptoms arising from the secondary lesions.

The interpretation of the x-ray findings, which if based upon a familiarity with the problem of the dentists' need, will often prevent ill feeling on the part of the patient, or too radical recommendations for treatment on the part of the physician or other specialists, or on the other hand, guided by broad experience in the observation of similar cases from both the medical and dental practice, will suggest the necessity of efficient yet conservative dental treatment.

Because of frequent experience with all sorts of cases, and because of unequaled opportunities for discovering unsuspected underlying etiologic factors, the roentgenologist may well be considered as a diagnostic clearing house—suggesting to which specialist a case should be referred for treatment and encour-

Fig. 7.—Fracture of left side of mandible near canine tooth, with very few teeth present. This is said to be the commonest site for fracture to occur.

aging co-operation between those specialists and incidentally rendering the patient the best service possible.

By employing the radiograph, nearly all guess work is eliminated. There are possibly a few instances, in which the x-ray may not be regarded as infallible evidence, but in the great majority of cases the evidence which it produces is an absolute reflection of existing condition. Periapical abscesses, cysts, osteomyelitis, necrosis, sequestra, lost roots, broken broaches in root canals, root canal work, check up on root canals after canals have been filled, fragments of instruments lost in the tissues, preoperative, orthodontic treatment and check up, impacted third molars and cuspids are definitely located through the aid of the x-ray, when all other diagnostic means have failed. In pyorrheal alveolar absorption again the dentist is enabled to definitely determine which teeth should be extracted and which retained as abutments for bridges or partial dentures.

In antral infection a definite diagnosis is reached. Again the x-ray positively shows whether the antrum is infected by diseased tooth roots penetrating

the antral floor, or whether the infective microorganism gained entrance through the nasal route. In fractures and dislocations, the condition is definitely revealed by the x-ray.

With the knowledge in our possession or at hand, for the dental surgeon, who will but avail himself of the opportunity, is there any excuse for the up-to-date dentist in depriving his patients of information which may be vital to their health and happiness? Is a dentist justified, when he makes a definite statement, that a tooth, which has been the seat of a chronic infection for years, is absolutely out of consideration as a possible source of secondary disease conditions? If this statement is made without thorough investigation the dentist imparts an incorrect diagnosis to his patient, who places implicit confidence in him, and as a result the patient's health has been undermined and impaired.

Fig. 8.—Fracture of left side of mandible just in front of second molar. First molar missing. The line of fracture in this region is nearly always oblique, running from above downward and backward.

In conclusion, let me sound a keynote of warning to the general practitioner—as a result of information gained through the use of the x-ray—

Save every vital pulp possible.

Don't devitalize teeth promiscuously.

Don't treat abscessed teeth—extract them, and curette diseased areas thoroughly.

Don't insert a lot of fixed bridge work on devitalized abutments.

Insert more removable bridge work, and partial dentures on vital teeth, you will spare your patient from focal infection and an endless chain of complicated secondary lesions.

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EDITORIALS

The Ethics of Orthodontic Patients

A GREAT many articles have been written upon professional ethics both as related to the medical and the dental profession, and several papers have appeared which have dealt directly with the question of ethics as involved in the practice of orthodontia. Several articles have been published on the relation which exists between the specialist and the general practitioner in regard to the referring of orthodontic cases and their treatment. The majority of these articles have either been written by men engaged in the practice of dentistry or men engaged in the practice of orthodontia and all of them seem to have been written entirely from the standpoint of the profession.

None of the articles, that we have read have paid any attention to the question of ethics from the standpoint of the patient. Therefore, some of

the things which we will say in this editorial may not exactly agree with the principles that have been laid down by some of the former writers because we are looking at the question from the standpoint of the patient as well as from the standpoint of the professional man. It must be remembered that all questions of ethics and questions of morality are simply questions of education. In other words, things that may be supposed to be right and proper at one time would not be considered the proper thing at another. We find the idea of right and wrong changes with the ideals of the people.

Certain practices are tolerated in one community or country which would not be considered right in another country. Still, who has authority to say that one is right and the other wrong? We only cite the fact that a few years ago in America slavery was considered right and proper and consequently was ethical. As a result of changed conditions the question as to whether slavery was right or wrong, whether it was ethical and moral, finally became a question over which the American people went to war before it was satisfactorily decided.

A few years ago any one who advocated the ownership of public utilities by the government was conceded to be more or less of a crank, a socialist, and a dreamer. But the passing of a few years has developed that the tendency of the majority of the people is for the government ownership of public utilities and a great many believe that the resources of a nation should belong to the people at large and not to a few individuals.

These are all changes in the ethics of the people which have been brought about by special education. Therefore, it would not be strange if in the practice of a profession conditions would develop which, from an ethical standpoint, would differ from the old rule of ethics which was held in former years or held by a few men. In the practice of orthodontics as related to the patient, there seem to be a certain number of conditions developing which make necessary certain changes in regard to ethics that differ from the opinion which is held by a great many writers. The rules of ethics as laid down by the medical and dental professions in the majority of cases have been formed for the benefit of the profession, and the patient, to a certain extent, has become a secondary matter. Of course, the welfare of the patient has been taken care of in a professional way. His care has been provided for by the profession at large, but he has not been consulted in regard to how or why he should be taken care of.

We find the practice of orthodontics somewhat different from the practice of any other phase of medicine or dentistry. In the practice of surgery, a surgeon performs an operation for the patient and the patient either dies or gets well in a comparatively short length of time. A physician is treating an individual for pneumonia or typhoid fever; the patient either recovers or succumbs also in a comparatively short period of time. Orthodontic cases extend over a long period of time. The same is true in the majority of dental operations—the dentist finishes the work and dismisses the patient. A patient who has had one surgical operation is not necsessarily obliged or compelled to go to the same surgeon for a second operation. The physicians do not own their patients after they have succeeded in curing or treating them in an attack

of typhoid fever, and if the patient has another illness he has the liberty to call in another practitioner to treat him for that particular illness. After a dentist has completed a piece of work the patient does not necessarily belong to that dentist but may seek another man for the next dental operation. Of course, it necessarily follows, in the case of the surgeon, the physician, or the dentist that if the results are satisfactory, the patients will return to those practitioners. However, we find that in neither surgery, medicine, nor dentistry does the practitioner have an ownership upon the patient nor is the patient compelled to return to him time after time and year after year unless truly satisfied with his work and with the personality of the operator.

In the practice of orthodontics conditions are decidedly different than they are in many other kinds of work. The treatment of a case of malocclusion necessarily covers a number of months and a large number of cases extend over a period of years. It may develop that a patient will begin an orthodontic treatment with one orthodontist and before the case is completed, for some reason or another, may decide that he would prefer to have the case completed by another man.

The reasons for the patient deciding to have a second man complete the orthodontic work may be many. It may be a question of personality in which the patient and the operator do not get along. It may also develop that the plan of treatment which the first man had employed was not satisfactory to the patient's parents and they desire to go to some one else who, they have found out by investigation, pursues a different plan of treatment and uses different methods. For example, one operator may be treating the case with a fixed appliance and the patient may decide that he prefers to have the case completed with a removable appliance. Under those conditions he will necessarily seek a man who uses removable appliances, and the question develops as to what right the patient has who begins the treatment with one man and goes to another. From the standpoint of the patient he has an absolute right to change orthodontists the same as he has a right to change dentists or family physicians. We are aware of the fact that this will not be in accord with a large number of men practicing orthodontia, who seem to think that when they begin the treatment of a case, regardless of what conditions develop between them and the patient, regardless of whether they are satisfying the patient with the results or methods used, the patient must continue under their treatment until the case is finished.

This is probably the professional attitude that has been held for a number of years, but nevertheless we do not believe it is absolutely a fair attitude to the patient, and do not believe that a man should practice orthodontics from that standpoint. If we recognize the possibility or the fact that the patient should be allowed the privilege of changing orthodontists provided the first man does not satisfy him for any reason, we immediately are confronted with the fact that it may be difficult to collect a fee which will properly compensate the first man for the work which he has done. This question of collecting a fee then involves the general plan of naming the fee or making financial arrangements with the patient in the beginning.

If patients are to be allowed the privilege of changing orthodontists dur-

ing treatment, this necessitates arranging the fee to provide a proper compensation for services rendered any time the patient wishes to change. Therefore the only fair way to the patient and to the operator would be to have fees so fixed as to make a definite charge for each operation or a definite charge for the amount of work done each month. For example, if a patient were to pay an orthodontist for the making and adjusting of an appliance, and then either pay a definite sum for each treatment or for each month's treatment, it can be readily seen that the patient who would desire to quit the first orthodontist at the end of the year or at the end of any month, could do so and there would be no misunderstanding in regard to the fee earned either by the patient or the orthodontist.

Recognizing the right of orthodontic patients to leave one orthodontist who is not rendering them satisfactory services, or one who is at least not satisfying them, regardless of what the condition may be, and going to another man, the relation of the second man to the first is one which has to be considered. For example, if a patient who is undergoing orthodontic treatment becomes dissatisfied with the first man and goes to the second man, what attitude should the second man hold toward that patient and what advice should he give?

We are aware of the fact that a great many men will say that no one has any right to take such a patient without consulting the first man and to use every means within his power to send the patient back to the first orthodontist. We are aware that such is the ethical side that is advocated by the rules of ethics and also aware from practical experience it is not the plan that is generally followed either in the dental or the medical profession.

Taking a similar case in the medical profession where a patient has been undergoing treatment for disease of the eye or throat trouble from one medical practitioner and decides to quit that man and go to another one. When the patient has left the first man and has decided he will not return, the second man can not succeed as a rule in making the patient go to the first man, and will only cause him to hunt for another practitioner. Again in the case of the dental profession, a patient may have been undergoing treatment for pyorrheal conditions from one dentist and decides to go to the second. He has left the first man for some particular reason which as a rule is none of the second man's business and has come to the second man because he prefers the second man's plan of treatment and prefers to place the case in his hands. If the man believes the first man was performing the proper treatment, we agree he would be performing the first man a service by telling the patient that the plan of treatment was successful and proper and in urging him to continue under the first man.

However, we do not believe that he should insist upon the patient's going back, because there may be personal reasons for which the patient will not return to the first man and the second man will be performing the patient a valuable service if he gives the best treatment possible under the conditions existing. When an orthodontic patient has been undergoing treatment from one man and for some reason decides to leave him and go to a second, shall the second man insist upon that patient returning to the first one or shall he

go ahead and render the best orthodontic service possible under the existing conditions? We realize that it is a very delicate question and one which has to be dealt with very carefully. However, we also know if an orthodontic patient decides to quit an orthodontist for whatever reason, there is no power on earth that will make that case return to the first man. The first man may be giving the proper treatment, may be accomplishing a good result, but something has arisen in the mind of the patient which has made him conclude he is going to some one else. We therefore believe it is time wasted in attempting to send that patient back to the first man for you only assist in sending him to some one else who may be unable to render as good a service as the first orthodontist or as good a service as you could render yourself. Therefore, admitting that the first orthodontist is performing the proper line of treatment, from the ethical standpoint of the patients they have a right to go to a second man if they are not satisfied with the first.

Some would say they have a right to go to the second man provided they have paid this first man for the treatment or service he has rendered them. We will admit that the question of the fee may be one of the things that has resulted in the patient leaving the first man, but we also do not believe that the second orthodontist should become a collecting agent for the first practitioner. The first man should have so made his financial arrangements with the patient that he would be able to collect his fee and collect for his services during treatment; probably had he done this, there would not have developed the misunderstanding which may have been the cause of the patient's seeking another orthodontist.

After considering orthodontic patients who quit a first operator and go to a second because of some misunderstanding when the orthodontic treatment is proper, we have another class of patients who become dissatisfied with the first plan of treatment because unsatisfactory results are being accomplished or because the patients are not pleased with the style of appliance or plan of treatment being pursued. We are forced to admit at the present time that there is such a thing as a proper plan of treatment by an orthodontist as compared with plans of treatment which do not have the sanction of the best men and which may be called improper orthodontics. For some reason or other the patients may have begun treatment with a man who did not possess a high degree of skill and after having the cases treated a number of months, they become aware of the fact that they are not getting the same service that friends of theirs are obtaining from men who are more proficient in the treatment of malocclusions. As a result of this, the patient who is getting poor orthodontic service goes to a man who is capable of rendering a good service. The proficient man sees the appliances are improperly and poorly constructed and the plan of treatment is not suited to the case, and if this plan of treatment is followed the orthodontic result is going to be unsatisfactory.

We are aware that under the rules of ethics one practitioner should protect another which should be done only so long as this protection can be rendered without causing the patient an injustice or without being a detriment to the science of orthodontics. If one man is attempting to treat a case of malocclusion and the treatment outlined in that case is going to be a failure, it seems

to us that any practitioner who would protect such a treatment, with the mistaken idea of protecting a fellow practitioner, is rendering all men engaged in the practice of orthodontics an injury, causing an injury to the patient, and hurting the science of orthodontics, because unsatisfactory results are going to follow from a faulty plan of treatment. We believe, then, it is the duty of a man where dissatisfied patients leave an improficient orthodontist and go to one who is able to accomplish a satisfactory result to take the case, begin the treatment, and show the patient that a satisfactory result can be obtained. We have known of cases that have been under orthodontic treatment for a number of years after which time the teeth were practically as irregular as they were in the beginning. The patients because they have not obtained satisfactory results in two or three years' treatment are at the point of condemning orthodontics as a whole, and it remains for any one who is able to accomplish a result in those cases to take the patients and prove to them that satisfactory orthodontic results can be obtained. We believe that when a man is so unskilled in the practice of orthodontics that he will place an appliance in the patient's mouth that is not suited for that particular case, one which produces actual injury to the patient during the course of treatment, the patient has a right to seek a more competent practitioner, one who will prevent an orthodontic failure and render the patient a service. We believe the patient should receive some consideration and if the patient becomes dissatisfied with the plan of treatment that is known to be an improper plan, it is folly and injustice to the patient and to orthodontics for any one to insist that they shall continue that treatment with the first man even though the code of ethics insists that one practitioner shall protect another.

The first duty of any profession is to humanity and to the public itself and the patient is entitled to some consideration, as well as the science of orthodontics is entitled to respect, for the fact remains that if a mistake is being made and that mistake can be rectified from an orthodontic standpoint it should be rectified by any one given an opportunity to do so.

Another question of ethics as regards the patient, which should receive consideration is found in those instances, where the patient begins treatment with one orthodontist, leaves the city, and the treatment must be continued by some man in another locality. While this question to a certain extent concerns the patient, it also to a greater extent concerns the two orthodontists. We realize that in a large number of instances the transfer of patients from one orthodontist to another, as a result of the patients changing their residence, has not been satisfactory to all concerned. This unsatisfactory condition has resulted because of faulty business arrangements between the two orthodontists, or between the orthodontists and the patient. This is a question which, for the benefit of the patient and orthodontist, should receive more attention than it has in times past. In a great many instances, one man will begin treating a case and after the patient has been under treatment for a period of time, he decides to change his location. The patient is referred to a man in the city to which the patient is moving and the difficulty that arises is generally over the question of a fee for services rendered by the first orthodontist and for service to be rendered by the man to whom the case is referred. This difficulty

over the question of fees which has arisen many times has been the result of several things.

The first man, who began the treatment of the case, may have been so unwise as to state a definite fee for which he would treat the case. He may have made arrangements in regard to the collection of the fee, or a certain sum to be payable in a certain length of time, with the result that most of the fee may have been collected before the patient decided to change locations. As a result of this, the patient goes to another town and desires a second man to complete the work for the remainder of the fee as named by the first operator. In a great many instances the first man was entirely honest in naming the fee and would have completed the case for the sum named. The first man who collected the majority of the fee may believe he has done the major portion of the treatment, but conditions develop which require the case to be watched for a number of months and maybe for years, and there follows a long period of retention during which time the second man has to be responsible for the case. He does much more work on the case than the first man did and the first man gets the larger portion of the fee. There is no question but that a great service has been rendered in the treatment of a malocclusion when the first appliances are adjusted, but the fact does not necessarily follow that the greatest amount of work has been done, or that the man who adjusts the appliance, treats the case a few months is entitled to a larger fee than the man who finishes the case and watches it through the period of retention. We have known of several cases where a decided misunderstanding has arisen between orthodontists over such a condition because the first man named a fee, collected over two-thirds of the fee for adjusting the appliance and treating it for a few weeks, and then expected the second man to finish the case for the remainder of the fee and watch the case during a much longer period of time than the man who began it.

It seems to us that the only logical way to adjust the question of fees in the transfer of patients, so as to be perfectly satisfactory to the patient and to the orthodontist, is for the first man to collect such a fee as he thinks he is entitled. The patient should then be sent to the other orthodontist with the understanding that he will have to make financial arrangements with the second man that will be satisfactory to the second orthodontist. The man who begins the treatment of a case of malocclusion should not attempt to arrange the fee for the second man, because conditions may differ in the two localities, or the man may conduct his practice along different lines and have a different plan for naming fees, and each one should be allowed to make his fee accordingly. If the patients are not satisfied with the financial arrangements which the second man insists upon, they can then seek the services of someone else, as they will not be obligated to the first man, for they have paid him for his services, and have only themselves to satisfy.

Another and unpleasant condition, from an ethical standpoint, which may arise in the transfer of patients is in regard to the manner of appliances and plan of treatment which is to be followed. We have known of several instances where patients have left men practicing in one locality and moved to another and before changing their location, the first man has impressed upon the patients

that the cases could be successfully treated only with a certain style of appliances and they should go to a man who was using only that kind. We believe this is a mistake for any man to be so conceited as to believe his particular style of appliance or any particular style of appliance is the only appliance which should be used or the only one with which a satisfactory result can be accomplished. It is very well to caution the patient in regard to seeking an orthodontist who has recognized ability, but to insist upon that man using a certain style of appliance is carrying the matter entirely beyond the principle of ethics and entirely beyond the welfare of the patient and the profession.

Another thing in regard to the use of a certain style of appliance, when patients transfer from one city to another, may arise in the mind of the second man. For instance, the first man may be using an appliance which the second man has not found satisfactory. It would therefore be foolish for the second man to continue the treatment of the malocclusion with the appliance that the first man had used when the second man could obtain a more satisfactory result in a shorter time by using a different appliance. Because a second man changes the appliance does not necessarily mean that the first man could not have accomplished the result with that appliance, but it simply means the second orthodontist can accomplish the result quicker and more easily with the appliance with which he is familiar than he can by attempting to treat the same case with an appliance he has not found satisfactory.

As an example which covers the facts mentioned we recall a case which was referred to us a few months ago from another city. The patient referred had been informed that the particular appliance which was being used on his teeth was one which was very superior to anything else and the most modern appliance that could be employed. The patient had been instructed in regard to the fact that this style of appliance must be used during the entire treatment. The patient had also been informed in regard to how much he should pay to have the case finished and it happened to be the remaining fee that the orthodontist in the first case had not collected. Upon examining the patient several weeks after leaving the first orthodontist, the regulating appliance was in very bad condition, and being a style of alignment wire, the screw on the alignment wire had been turned so far that it had reached its limit of usefulness. In other words, no one could treat the case any further successfully with that appliance because the limit of usefulness had been passed owing to all of the thread on the alignment wire being utilized. The amount of work necessary to be done on the teeth was entirely out of keeping with the small fee that was supposed to be collected for doing the work. The patient immediately informed us that a certain style of appliance was to be used on the case and the first man had informed him that he should only pay a certain fee for having the case completed. Under those conditions it was practically impossible for us to continue the treatment of the case. The result of this was that the patient went somewhere else. Whether he succeeded in finding a man who was willing to follow his instructions in treating the case, we do not know. However, the difficulty in this case could have been avoided, if the first man had not insisted upon making financial arrangements for the second man and had he not insisted upon choosing the appliance the second man should use on the case.

We believe, therefore, in the transfer of patients from one locality to another, during the period of active treatment the first man should collect a fee for his services, allow the second man the liberty of making financial arrangements suitable for his services, and allow the second man the privilege of using the kind and style of appliance he wishes to choose.

We have another question of ethics from the standpoint of the patient which involves those patients who remain only a short time in the city and in which it is necessary that they see a second orthodontist but one or two times. The question naturally arises what should be the attitude of the orthodontist giving emergency treatment to those cases in regard to the question of fees. We realize that it has been a matter of custom among many orthodontists, particularly where men have been personal friends, to give emergency treatment to a case of that sort without making any professional charge. This plan may be perfectly justifiable when doing a friendly act for the orthodontist, but from the standpoint of the patient, it creates a bad precedent, neither is it fair to the man rendering the emergency service. From an ethical standpoint, there is no reason why a patient who has one treatment with an orthodontist should not pay for that one treatment in the same proportion and rate that other orthodontic patients pay during the process of regular treatment. We believe that when one orthodontist has a patient living in a certain city, and he has that patient call on another orthodontist, the patient should be informed that he will be expected to pay the man such a fee for treatment as he receives from his regular patients for the same service. Such a plan will relieve every one of obligation and the patients will be paying no more than the usual fee which the second orthodontist receives for such services. As a question of ethics in these cases, a man giving emergency treatment should be very careful not to make any remarks in regard to the treatment that was carried on by the first orthodontist which may be misinterpreted by the patient. The second man may necessarily not agree with everything that the first man is doing, but as he will not have an opportunity to finish the case, and as he is only supposed to be rendering a service for the time being, he should render that service, allow that patient to return to the first man in exactly the same state of mind as he was when the second man saw him.

We have mentioned the inadvisability of a dentist or an orthodontist who begins the treatment of a case of malocclusion advising the patient as to what he should pay to have the case completed if the patient moves to another city. A similar condition exists where the patient seeks the advice of an orthodontist in one city but is not able to have the first orthodontist treat the case. The man who examines the case first refers the patient to an orthodontist in the locality in which the patient lives, but in making that reference, he should not insist upon the plan of treatment that the second man shall follow as the only plan that may be correct. It is perfectly feasible for him to advise the patient what should be done or how he would do it and what kind of appliance he would use, but it is not right for him to insist that the second man should follow exactly the same plan of treatment or use the same appliance. If the patient likes the plan outlined by the first man, it is the patient's business of course to find a man who will follow that plan.

In a great many instances the second man may accomplish the same results by using a different appliance and accomplish it more quickly than if he used the appliance as outlined by the first man. It is also unfair for an orthodontist to examine a case and inform the patient that he should pay only a certain fee, because one man has no right to regulate the fee of another. No man should place the value upon the professional services of a second man, and, consequently, he should leave the patients free to choose the orthodontist and pay what they want to pay for professional services without informing them that they should only pay a certain fee and no more.

Another question of ethics from the patient's standpoint is that involved where the patients began treatment with a general practitioner. After the case has been under treatment a while the patient finds out that there are specialists engaged in the treatment of malocclusion and probably compares the results being obtained in his case with those being obtained by specialists. He becomes dissatisfied with the general practitioner and seeks the services of a specialist. Probably from an ethical standpoint, as laid down in the code of ethics by some writers, the specialist should have nothing to do with the case that has been begun by a general practitioner; that is, some of them would have us believe because the general practitioner has begun the treatment of the malocclusion, the patient should be compelled to continue with him regardless of the results that are being obtained. We do not believe that orthodontists should try to influence the patients to leave a general practitioner, but we do believe, that when the patients, because of their own free will, and because of knowledge obtained in various ways, become dissatisfied with the result that is being obtained and all orthodontic knowledge shows that those results are going to be failures, if the orthodontist does not take the case when the patient desires him to and carry it to a satisfactory result, he is not doing the proper thing by the patient or doing the proper thing to advance orthodontics as a science. We realize such a statement is more or less revolutionary in regard to some of the things that have been taught under ethics in times past, but we contend there is such a thing as ethics from the patient's standpoint and the first duty of a specialist in any profession or science is to render a service to the public, showing them the difference between good orthodontics and bad orthodontics.

We therefore believe that when a patient who becomes dissatisfied with results being obtained, consults an orthodontist, the orthodontist is doing the proper thing by giving the patient the service he is entitled to, instead of insisting that he go back to the general practitioner. Any man who would insist upon a patient returning to a general practitioner who is accomplishing an unsatisfactory result would be unfair to himself and unfair to his specialty. We have known of a great many cases treated by men with a small knowledge of orthodontia, who worked on the case a number of years, collected a certain fee, and obtained such a result that after they were through they should not only have returned the original fee to the patient, but should have paid the patient for having allowed them to work on the case. We believe therefore from an ethical standpoint that the patient is entitled to as much consideration as anyone, and should be the first consideration in all orthodontic practices.

Another phase of the subject from the patient's standpoint involves the

right of the patient who has begun orthodontic treatment to go to another practitioner and seek advice in regard to the results that are being accomplished under the present plan of treatment. The patient may have been receiving orthodontic service for a number of months or years and for some reason the question has arisen in his mind whether proper results that should be obtained in the treatment of that case were being obtained. When such a patient presents himself to a second orthodontist, he is entitled to that advice; but, in giving advice, the second orthodontist should first place himself in the position of the first man as well as in the position of the patient. We all realize that if we were having orthodontic service for our own children and believed that that service was not satisfactory, we would probably desire to seek someone whom we believed capable of giving advice upon the subject. The second man should very carefully take into consideration everything, for in a great many instances he does not know the circumstances under which the first man has been compelled to treat the case, and consequently the advice which he gives the patient should be very carefully chosen, and anything he tells the patient should be told in such a manner as to force him to realize that the first man has done everything possible under the circumstances, if such seems to be the truth. However, if conditions should indicate that progress is not being made as rapidly as it should be made, or if the appliance produces an action that is injurious upon the teeth and surrounding tissue, then telling the patient the truth does not become such an easy proposition, and probably all he should be told is that you yourself would not use that plan of treatment. However, if the appliance is doing actual injury and other things indicate that the first man is not able to accomplish a satisfactory result from an orthodontic standpoint, it is proper and right that you should advise the patient that the case could be more hygienically treated by using a different plan than is being employed. We realize that this is a very troublesome question and one that has been given careful consideration, but still it is a question in which the patient is entitled to some consideration, if one is willing to place himself in the patient's position.

We realize that one man has to be very careful in regard to giving advice to a patient because there are a large number of individuals and lawyers, who under the least possible pretense, are willing to file damage suits against the professional man if they can get the least possible grounds. Therefore it would be unwise for any man to actually condemn an operation and condemn the style of appliance that is being used by telling the patient that it is absolutely contraindicated and that the treatment is faulty and wrong. Even though the man believes the appliance would not accomplish the result, he should only say that in his case he would use a different kind of appliance than the one that is being used. We must realize that some men can get a result from one appliance while others can get a result from another. When the patient under orthodontic treatment seeks our advice, we can only give our personal opinion, which amounts to nothing more than stating our opinion against that of the other man and we should in no other way make any statement which may be contributed as a possible ground for damage suits.

We know that the question of ethics from the patient's standpoint is a very

large problem and one which presents a phase in nearly every individual case that we are anxious to get away from, and very few of us have had the moral conviction to approach the question and study things from the standpoint of the patient. That the patient has some rights must be recognized, and the sooner the profession recognizes those rights and are willing to place themselves in the position of the patient, the sooner will the troublesome questions adjust themselves, because nothing will be gained by allowing a condition to exist that is not exactly right to every one concerned.

The President of the American Society of Orthodontists

THIS month we present in our frontispiece the photograph of Oliver W. White, D.D.S., of Detroit, Michigan, who was elected to the presidency of the American Society of Orthodontists at their eighteenth annual meeting held in Chicago, August 1, 2, and 3, 1918.

Doctor White was born in Chatham, Ontario, Canada, on January 4, 1876. He attended the Chatham Collegiate Institute, and matriculated from the Royal College of Pharmacy in 1894. In 1895 he entered upon his studies in the Dental Department of the University of Michigan, and received the degree of Doctor of Dental Surgery in 1898 and Doctor of Dental Science in 1899. In 1903 he attended the Angle School of Orthodontia. Being president of dental societies is no new honor to Doctor White, for at various times he has been president of the First District Dental Society of Detroit, the Michigan State Dental Society, and the Detroit Dental Club. He is an honorary member of the Toledo Medical Society and a member of the Wayne County Medical Society.

SAINT APPOLONIA

(From painting by Carlo Dolci, in Galleria Corsini, Rome, Italy)

Saint Appolonia, Patron Saint of Dentistry, was born in Alexandria, and lived during the third century. In the year 300 A.D. she was canonized by the Church of Rome, and the ninth of February has been observed by the Church of Rome in her commemoration.

"As a Christian she was tortured by having her teeth broken and extracted, after which she was burnt at the stake. When under torture she is said to have prayed that those who remembered the day of her martyrdom, and in their prayers realized the pain she suffered, might never have toothache or headache."